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FLORA OF THE LESSER ANTILLES

Leeward and Windward Islands

BY

RICHARD A. HOWARD

Arnold Arboretum
Harvard University

VOLUME 2

PTERIDOPHYTA

BY

GEORGE R. PROCTOR

Institute of Jamaica
Kingston, Jamaica

Arnold Arboretum, Harvard University
Jamaica Plain, Massachusetts

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INTRODUCTION

The present work records and describes some 323 species of pteridophytes known to grow outside of cultivation in the Lesser Antilles. These are classified in 11 families and 68 genera. Of these, the vast majority (238 species) belong to the family Polypodiaceae as treated here (in the broad sense). Out of the total, 46 taxa (roughly 14%)[1] are considered endemic to these islands, a comparatively low figure reflecting the geologically recent formation of the Lesser Antilles, as well as the comparative proximity of continental or insular sources of migrant vegetation. With few exceptions (e.g., *Asplenium harpeodes*, *Blechnum rufum*, *Lonchitis aurita*), all species and varietal records in this book are based on examination of Lesser Antillean specimens and in most cases of living plants growing in their natural habitats. In order to save space, the several thousand herbarium specimens seen have not been cited, but work sheets listing most of these are filed at the Arnold Arboretum of Harvard University, 22 Divinity Ave., Cambridge, Massachusetts, and at the Institute of Jamaica, Kingston, Jamaica. In cases in which rare species are known only from a single or few collections, specimen citations have been provided. All specimens cited have been seen by the author unless otherwise noted; types have been seen in nearly all cases in which the herbarium of deposit is noted. The majority of the herbarium specimens studied are located in the herbaria of Harvard University and the Institute of Jamaica, but a number of other important collections were also consulted. The following standard abbreviations for herbaria have been used:

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[1] The following are considered endemic:

Asplenium malcolm-smithii
Blechnum binervatum
B. rufum
B. violaceum
Cnemidaria grandifolia
  var. *grandifolia*
Ctenitis excelsa
C. macrotheca
C. meridionalis
Cyathea elliottii
C. hodgeana
C. imrayana var. *imrayana*
C. muricata
Danaea stenophylla
Diplazium apollinaris
D. godmanii
D. legalloi
Elaphoglossum boryanum
E. feei
E. hirtum var. *hirtum*
E. impressum
E. plumieri
Eriosorus hispidulus
  var. *dominicensis*
Gleichenia farinosa
G. furcata
Grammitis eggersii
G. knowltoniorum
G. phlegmaria
  var. *antillensis*
G. serricula
G. stipitata
G. tenuicula
  var. *tenuicula*
Hymenophyllum hirtellum
  var. *gratum*
  var. *vincentinum*
H. latifrons
Lindsaea l'herminieri
Lycopodium sieberianum
Odontosoria flexuosa
Polystichum guadalupense
Selaginella flabellata
S. rotundifolia
Thelypteris antillana
T. clypeolutata
T. consanguinea
T. cooleyi
T. hydrophila
T. limbata
T. muscicola

ARNOLD ARBORETUM HARVARD UNIVERSITY

A	Arnold Arboretum of Harvard University, Cambridge, Massachusetts
B	Botanisches Museum, Berlin
BM	British Museum (Natural History), London
GH	Gray Herbarium of Harvard University, Cambridge, Massachusetts
IJ	Institute of Jamaica, Kingston
K	Royal Botanic Gardens Herbarium, Kew
NY	The New York Botanical Garden, New York
P	Laboratoire de Phanerogamie, Museum d'Histoire Naturelle, Paris
U	Botanical Museum and Herbarium, Utrecht
US	The United States National Herbarium, Washington, D. C.

In preparing this book, efforts have been made to establish the accurate typification of each species as far as possible and to ascertain the origin and present location of type specimens. Regrettably, it has not been possible to trace the types of all names used. In the case of some authors (e.g., Kunze) whose collections are known to have been destroyed, it will be a long task to track down duplicate specimens for the purpose of lectotypification. This is, of course, far beyond the scope of a work such as the present one.

The synonymy cited below the accepted name of each species or variety represents, for the most part, either names based on Lesser Antillean types or names attributed to Lesser Antillean material in published records. The given synonymy is therefore often far from complete, except (presumably) for endemic taxa.

The distribution of each species in the Lesser Antilles has been indicated by listing the islands from which specimens have been seen (or, rarely, islands mentioned in literature citations). These are given in a roughly north-to-south order. A complete list of islands with parenthetical figures indicating numbers of pteridophytes recorded from each island appears below.

Anguilla (none)
St. Martin (15)
St. Barthelemy (8)
Barbuda (1)
Antigua (27)
Saba (69)
St. Eustatius (37)
St. Kitts (129)
Nevis (79)
Redonda (2)
Montserrat (117)
Guadeloupe (272)
La Desirade (7)
Marie Galante (16)
Les Saintes (7)
Dominica (194)
Martinique (218)
St. Lucia (116)
St. Vincent (162)
The Grenadines (3)
Grenada (151)
Barbados (30)

A dry, statistical summary like the above list gives no hint of the long, complex, and fascinating history of botanical exploration in these 22 islands and island-groups. Unfortunately, it is not possible in the present context to do justice to this history. Many persons of various nationalities have collected ferns and other plants in this area during the past three centuries. Their individual stories, which often must have included some remarkable adventures, have in most cases never been told, and their specimens are scattered far and wide in the museums of Europe and North America. In order to give some idea of the scope of these collections, a chronological summary of the chief collectors of Lesser Antillean pteridophytes is presented below.

NAME & NATIONALITY	COLLECTION DATES	ISLANDS	HERBARIA
Charles Plumier (French)	1689	Martinique	P (few extant; mostly drawings)
N. J. F. Jacquin (Austrian)	1759	St. Martin St. Barthelemy St. Eustatius St. Kitts Guadeloupe St. Vincent Grenada	(few extant)
L. C. Richard (French)	1786–87	Anguilla Barbuda Antigua Guadeloupe Martinique	P
J. E. Forsström (Swedish)	1805–12	St. Barthelemy	S
C. G. Bertero (Italian)	1816–18	Guadeloupe	B, P
Rev. L. Guilding (born in St. Vincent of English parents)	1817–31	St. Vincent	K
Franz Kohaut (Czech)	1819–31	Martinique	(widely distributed as Sieber Exsicc.)
Auguste Plée (French)	1820	Guadeloupe Martinique	P
	1821	St. Martin St. Barthelemy St. Lucia	

Name & Nationality	Collection dates	Islands	Herbaria
G. S. Perrotet (Swiss)	1824, 1841	Guadeloupe Martinique	P
John Imray (Scottish)	1837–80	Dominica	K
Ferdinand L'Herminier (born in Guadeloupe of French parents)	1843–66	Guadeloupe	P (widely distributed)
H. P. Mazé (French)	1851–92	Guadeloupe Marie Galante Martinique	B, IJ, K, P
Ludwig Hahn (German)	1864	Martinique	BM, P
Père A. Duss (Swiss)	1876–89	Martinique	NY, P
	1883, 1885	Dominica	
	1885	St. Lucia	
	1890–99	Guadeloupe Marie Galante	
	1899–1900	Martinique	
W. F. R. Suringar (Dutch)	1885	St. Martin Saba St. Eustatius St. Kitts	L
H. F. A. von Eggers (born in Germany and took Danish nationality)	1880–83	Dominica	(widely distributed)
	1882	St. Kitts	
	1889–91	St. Vincent Bequia Grenada Barbados	
G. A. Ramage (English)	1888–89	Dominica St. Lucia	K
H. H. Smith (American) and G. W. Smith (Barbadian of African descent)	1889–90	St. Vincent	GH, IJ, K
R. V. Sherring (English)	1890–91	Grenada	BM, IJ, US

Name & Nationality	Collection dates	Islands	Herbaria
N. L. Britton (American) and J. F. Cowell (American)	1901	St. Kitts	NY
W. E. Broadway (West Indian of African descent)	1906	Grenada	BM, K
I. Boldingh (Dutch)	1906	St. Martin Saba St. Eustatius	U
J. A. Shafer (American)	1907	Montserrat	NY
Karel Domin (Czech)	1926	Dominica	PR
H. E. Box (English)	1931–38	Antigua St. Kitts St. Lucia Grenada	BM, IJ
Adrien Questel (French)	1932–42	St. Barthelemy Guadeloupe	P
G. P. Cooper (American)	1933	Dominica	US
H. Stehlé (Swiss/French)	1935–60	Guadeloupe Martinique	IJ, P, US
V. & P. Allorge (French)	1936	Guadeloupe	IJ, P
J. Feldmann (French)	1936	Guadeloupe Martinique	IJ, P
W. H. Hodge (American)	1937–40	Dominica	GH
C. V. Morton (American)	1947	St. Vincent	US
R. A. Howard (American)	1950	St. Kitts Nevis Montserrat Guadeloupe St. Lucia Grenadines Grenada	A, IJ

Name & Nationality	Collection dates	Islands	Herbaria
	1970	Montserrat	
	1971, 1972	St. Vincent	
	1973	St. Martin Saba St. Eustatius	
A. L. Stoffers (Dutch)	1953	St. Martin Saba St. Eustatius	U
G. R. Proctor (American, resident of Jamaica)	1957	Grenada	A, IJ, U, US
	1958	Dominica St. Lucia	
	1958–59	Anguilla St. Martin St. Kitts	
	1959	Nevis Montserrat Guadeloupe Marie Galante Les Saintes	
	1960	Antigua La Desirade Marie Galante Martinique St. Lucia	
	1965	Antigua Dominica St. Lucia St. Vincent Barbados	
G. R. Cooley (American)	1962–72	St. Vincent	A, IJ
D. B. Lellinger (American)	1965	Dominica	US

It should be noted that several other collectors gathered ferns in Dominica for the U. S. National Herbarium from 1964 to 1966, but their collections are mostly incidental to more general collections of flowering plants.

The above list is far from complete; many other collectors who concentrated on flowering plants or various cryptogamic taxa have gathered a few ferns here and there. In addition, a number of persons known to me only by name have apparently made fern collections on various Lesser Antillean islands; these collections have been mentioned or cited in publications dealing with the flora of this area, but as I have seen none of their material, I have omitted them from my list.

In the first volume of the present series, The Orchidaceae by L. A. Garay and H. R. Sweet, Dr. Richard A. Howard has presented a chapter entitled "Phytogeographic and Floristic Relationships," which accurately summarizes the main types of vegetation occurring in the Lesser Antilles. The reader is referred to that chapter for general information on this subject.

In conclusion, a summary of floristic works or lists (cited by author and date) which deal with the pteridophytes of the individual Lesser Antillean islands is presented below. Full citations of these publications are listed in the bibliography at the end of this volume.

General works: Grisebach, 1864; Fée, 1866; Jenman, 1898–1909.
Anguilla: none.
St. Martin: Boldingh, 1909; Kramer, 1962.
St. Barthelemy: Wikström, 1826a; Questel, 1941.
Barbuda: none.
Antigua: Alston, 1935.
Saba: Wikström, 1826b; Boldingh, 1909; Kramer, 1962.
St. Eustatius: Wikström, 1826b; Boldingh, 1909; Kramer, 1962.
St. Kitts: Box & Alston, 1937; Proctor, 1962.
Nevis: none.
Montserrat: none.
Guadeloupe: Wikström, 1828; Husnot, 1870; Duss, 1903.
La Desirade: Duss, 1903.
Marie Galante: Duss, 1903.
Les Saintes: none.
Dominica: Domin, 1929; Hodge, 1941, 1954; Morton & Lellinger, 1967, 1971.
Martinique: Plumier, 1693, 1705; Husnot, 1870; Duss, 1903.
St. Lucia: none.
St. Vincent: Baker, 1891; Rolfe, 1893; Morton & Lellinger, 1967, 1971.
Grenadines: none.
Grenada: Baker, 1892.
Barbados: Maycock, 1830.

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In particular, I wish to acknowledge the help and encouragement of Dr. Richard A. Howard, Director of the Arnold Arboretum, whose own interest in the Lesser Antilles, which has extended over many years, was directly responsible for initiation of this work. Field trips which allowed the author to collect hundreds of fern specimens (along with thousands of flowering plant specimens) on a majority of the Lesser Antillean islands between 1957 and 1960 were financed chiefly by National Science Foundation Grant G 4441, principal investigator, Dr. R. A. Howard.

In addition, I would like to thank Dr. George R. Cooley whose support made possible a collecting trip to St. Vincent and other islands in 1965, and who also participated in much of the field work on this occasion.

It would be impossible to fully acknowledge the hospitality, help with transportation, and other favors received from numerous persons during my field work in the Lesser Antilles. However, particular thanks should be extended to the following: the late Mr. Malcolm Smith and Mrs. Smith (St. Kitts); Mr. & Mrs. Byron, Mr. H. Croucher, and others (Nevis); Mr. & Mrs. Kingsley Howes (Montserrat); Père C. LeGallo and Dr. & Mme. H. Stehlé (Guadeloupe); Père Dussouet (La Desirade); Père F. Barbottin and Père Galichon (Marie Galante); Mr. Cyril Hill (Dominica); Mr. H. V. Atkinson, Mr. W. G. Lang, the late Mr. Harold Simmons, Mr. P. Martin-Kaye, The Earl of Oxford and Asquith & Lady Oxford, and several others (St. Lucia); Mr. C. L. De Freitas (St. Vincent); Mr. Garth Southwell and Mr. & Mrs. N. Deallie (Grenada); and Mr. & Mrs. J. Bannochie (Barbados).

Special thanks are due to the many artists whose illustrations appear throughout this volume. Finally, I would like to express my appreciation to Ms. Brooke Thompson-Mills for her meticulous attention to detail in editing and proofreading.

Deep appreciation is extended also to the Trustees of the Charles E. Merrill Trust, which has aided in the publication of this volume by means of a grant to the Arnold Arboretum.

PTERIDOPHYTA

Vascular plants of terrestrial, epiphytic, or (rarely) aquatic habitats, having a life cycle of two distinct, independent phases, called sporophyte and gametophyte, which normally alternate with each other in regular sequence. The sporophyte, nearly always the more conspicuous phase of the life cycle, is usually differentiated into roots, stem (in these plants called rhizome or caudex), and leaves (called fronds in the ferns and fernlike species); these structures always contain specialized (vascular) tissues for the conduction of water, nutrients, and other substances soluble in water. In leafy tissues the vascular strands are evident as veins. The sporophyte moreover produces asexual spores (reproductive disseminules) which are either all alike (plants homosporous) or of two unlike kinds called megaspores and microspores (plants heterosporous); spores are borne in specialized capsules or sporangia, and are of microscopic size. A germinating spore produces a gametophyte, in most cases called a prothallus, a minute plant with or without chlorophyll and usually lacking vascular tissue whose form and structure are characteristic of different taxonomic groups. In the homosporous groups, the prothallia are all similar in size and appearance, but may be either monoecious (both sexes in the same individual) or dioecious (male and female organs on separate individuals); in the heterosporous groups they are dissimilar and dioecious, the gametophytes that develop from microspores bearing only male reproductive organs (antheridia) and those from megaspores bearing only female organs (archegonia). The male gametes (spermatozoids) in all pteridophytes are motile by means of coiled cilia. Fertilization of the female gamete (egg cell or archegone) by a spermatozoid (which requires the presence of a droplet of water to reach its destination) results in the formation and growth of a new sporophyte plant. Both sporophytes and gametophytes are in many cases also capable of reproduction by vegetative means, resulting in the development of clones.

It should be noted that the term "fern allies" has long been applied to those vascular plants which, although very different in appearance, were thought to bear some sort of relationship to true ferns (*Pteropsida*) because of basic similarities in their life cycles. However, it is now known that the four main classes of Pteridophyta have a separate ancestry going far back in geologic time, and although they may have a remotely common origin, they cannot be considered "allied" in the sense of a close relationship. Their association under the inclusive name Pteridophyta is primarily a matter of convenience, indicating a more or less common level of evolutionary development with regard to vascular tissues and reproductive cycles.

In classifying any group of organisms in a limited area like the Lesser Antilles, it is difficult to present a rational arrangement that will make sense in a worldwide context. Many major and minor taxa are absent from the classification because their representatives do not grow in the area under study. Another problem arises from the fact that no two taxonomists have ever agreed on how ferns can best be classified; these plants show complexities of relationship difficult to analyze and interpret. Today, techniques unknown to earlier pteridologists are being developed to aid in fern classification, but general agreement has yet to be achieved.

The tendency in modern fern taxonomy is toward more and more fragmentation at both the family and generic levels. Although this "splitting" reflects a growing knowledge of differences in details, at the same time it unfortunately shows a declining appreciation for the many similarities which characterize ferns as a whole. The present writer prefers to maintain a rather conservative approach to family and generic status in the belief that the trend toward more and more splitting results in an unbalanced taxonomy that unduly exaggerates the significance of differences, and at the same time vitiates the usefulness of names as a means to recognition.

CONSPECTUS OF THE MAJOR TAXA

In the present work, an effort has been made to present a scheme of classification with broad validity. The following "conspectus" presents a brief description of the four classes of Pteridophyta (of which one is not represented in our area), but further enumerates only the taxa actually occurring in the Lesser Antilles. The numbering of these taxa is therefore relevant to this region only.

Class I. **Psilopsida.** Plants without true roots; leaves present or represented by minute scales; stems dichotomously branched; homosporous, the spores borne in solitary sporangia with 2 or 3 locules. A single order, Psilotales, with one family, Psilotaceae. (p. 16)

(Class **Sphenopsida.** Plants with true roots, hollow nodose stems, and scalelike leaves arranged in whorls at the nodes; homosporous, the spores borne in multiple separate sporangia, these on peltate sporangiophores clustered to form a terminal strobilus. A single order, Equisetales, with one family, Equisetaceae, not known to occur in the Lesser Antilles.)

Class II. **Lycopsida.** Plants with true roots, solid herbaceous stems, and numerous small, sessile, costate leaves mostly spirally arranged in 4 to many ranks; homosporous or heterosporous, the spores borne in solitary sporangia located at the adaxial base of fertile leaves (sporophylls), these similar to the sterile ones or else modified and aggregated in terminal cones (strobili).

Order 1. **Lycopodiales.** Terrestrial or epiphytic plants with elongate stems.

Family 1. **Lycopodiaceae.** Plants homosporous. (p. 18)

Family 2. **Selaginellaceae.** Plants heterosporous. (p. 34)

(Order **Isoetales.** One family, Isoetaceae. Aquatic or semiaquatic with shortened, cormlike stems; heterosporous. Not found in the Lesser Antilles.)

Class III. **Pteropsida.** Plants with true roots; stems herbaceous, subwoody, or trunklike; leafy organs of various forms, often large and called fronds, which functionally are sporophylls. Homosporous or heterosporous, the spores borne in sporangia of various positions and structures, produced on unmodified leafy sporophylls or on highly modified ones.

Order 1. **Ophioglossales.** Sporangia relatively massive, without special differentiated tissues, dehiscing by a transverse slit, and borne on special spikes or panicles distinct from the green, leafy blades;

spores trilete. Roots lacking root hairs. A single family, Ophioglossaceae. (p. 42)

(ORDER **Osmundales.** Not found in the Lesser Antilles.)

ORDER 2. **Marattiales.** Sporangia relatively massive, coalesced in synangia borne on the abaxial surface of green, leafy fronds; spores monolete. Roots with multicellular root hairs. A single family, Marattiaceae. (p. 45)

ORDER 3. **Filicales.** Sporangia relatively small, borne in clusters, lines, or masses on ordinary leafy fronds or their modified parts, or in some cases on special contracted, nonleafy fronds, usually rupturing suddenly by means of an elastic ring of thickened cells (the annulus). Plants homosporous and chiefly either terrestrial or epiphytic. Gametophytes green, chiefly monoecious.

FAMILY 1. **Schizaeaceae.** Sporangia borne singly or in rows on specialized lobes of ordinary frond divisions, or else on specialized nonleafy pinnae; annulus forming an apical cap on the mostly ovoid or ellipsoid sporangia, these opening by a vertical slit on one side. (p. 49)

FAMILY 2. **Gleicheniaceae.** Sporangia grouped in small clusters dorsally on green, leafy fronds, these pseudodichotomously branched, often forming tangled thickets. Annulus obliquely transverse on the pyriform, subsessile sporangia, which open by a longitudinal slit. (p. 57)

FAMILY 3. **Hymenophyllaceae.** Sporangia borne on a filiform or clavate stalk (receptacle) partially or wholly surrounded by a tubular, salverform, or bivalvular involucre; annulus oblique or horizontal, the sporangia rupturing vertically; involucres marginal on green, leafy fronds; frond tissue in most species delicate, 1 cell thick, lacking stomata. "Filmy ferns." (p. 64)

FAMILY 4. **Cyatheaceae.** Sporangia clustered in round, dorsal sori, with or without a subtending or enclosing indusium, often borne on more or less raised receptacles on the abaxial side of green, leafy fronds (usually of large size); annulus oblique or somewhat twisted, with or without a stomium of thin-walled cells at the point of transverse rupture. Rhizome (caudex) usually stout, woody, and trunklike. "Tree-ferns." (p. 97)

FAMILY 5. **Polypodiaceae.** Sporangia relatively long-stalked (the stalks with 1–4 rows of cells), arranged in lines or clusters (sori), or else more or less completely covering the abaxial side of leafy or modified nonleafy fronds; sori marginal or dorsal, with or without protective indusial structures; annulus vertical, interrupted by a stomium of thin-walled cells at the point of transverse rupture. Plants small or large, of diverse structure and habit, the rhizomes hairy or scaly. This family includes the majority of living ferns. (p. 111)

ORDER 4. **Marsileales.** Heterosporous and monoecious, the sporangia (megasporangia and microsporangia together) borne inside bony sporocarps representing modified pinnae; annulus vestigial. Fronds filiform, 2-foliolate or 4-foliolate, of circinnate growth; plants of muddy or subaquatic habitats. A single family, Marsileaceae. (p. 377)

CLASS I. PSILOPSIDA

Family PSILOTACEAE

Plants mostly epiphytic, the green stems either simple and provided with small, 2-ranked leaves (*Tmesipteris*) or several- to many-times dichotomous and appearing leafless, the leaves being remote, minute, and scalelike. Sporangia 2-loculed (*Tmesipteris*) or 3-loculed and dehiscing vertically, attached on adaxial base of minute bifid sporophylls. Spores reniform, all similar. Gametophytes subterranean or embedded in humus, tuberous.

Usually considered to be the most primitive living group of vascular plants, with 2 genera, *Tmesipteris* of the South Pacific islands, and *Psilotum*, pantropical.

PSILOTUM Swartz

Psilotum Sw. in J. Bot. Schrader 1800(2): 109. 1801. FIGURE 1.

Plants epiphytic or on old masonry, sometimes terrestrial. Rhizome short-creeping, dichotomously branched, beset with small, brownish, hairlike rhizoids. Stems loosely clustered, the lower unbranched part more or less elongate, dichotomous above into numerous narrow divisions. Leaves alternate, distichous, or 3-ranked, minutely awl-shaped. Sporangia depressed-globose, sessile, 3-lobed, 3-loculed; spores hyaline.

TYPE SPECIES: *Psilotum triquetrum* Sw., now correctly known as *Psilotum nudum* (L.) Griseb.

Two species of this genus are known, one occurring in the Lesser Antilles.

1. **Psilotum nudum** (L.) Griseb. in Abh. Ges. Wiss. Gött. 7: 278. 1857.

Basionym: *Lycopodium nudum* L., Sp. Pl. 2: 1100. 1753.

Type: LINN *1257.1*, stated to be found "in Indiis." Linnaeus also cited Dillenius, Hist. Musc. 468, *t. 64*, *fig. 4*, and Plumier, Tr. Foug. 145, *t. 170*, *fig. A*. The former illustration is copied from the latter (it is a reversed or "mirror" image). Plumier did not indicate the source of his material, though it undoubtedly came from either Martinique or Hispaniola.

Syn.: *Hoffmannia aphylla* Willd. in Mag. Bot. Römer & Usteri 6: 17. 1789.
Psilotum triquetrum Sw. in J. Bot. Schrader 1800(2): 109. 1801; Fl. Br. W. Ind. 648. 1864.
Bernhardia dichotoma Willd. in J. Bot. Schrader 1800(2): 132. 1801.

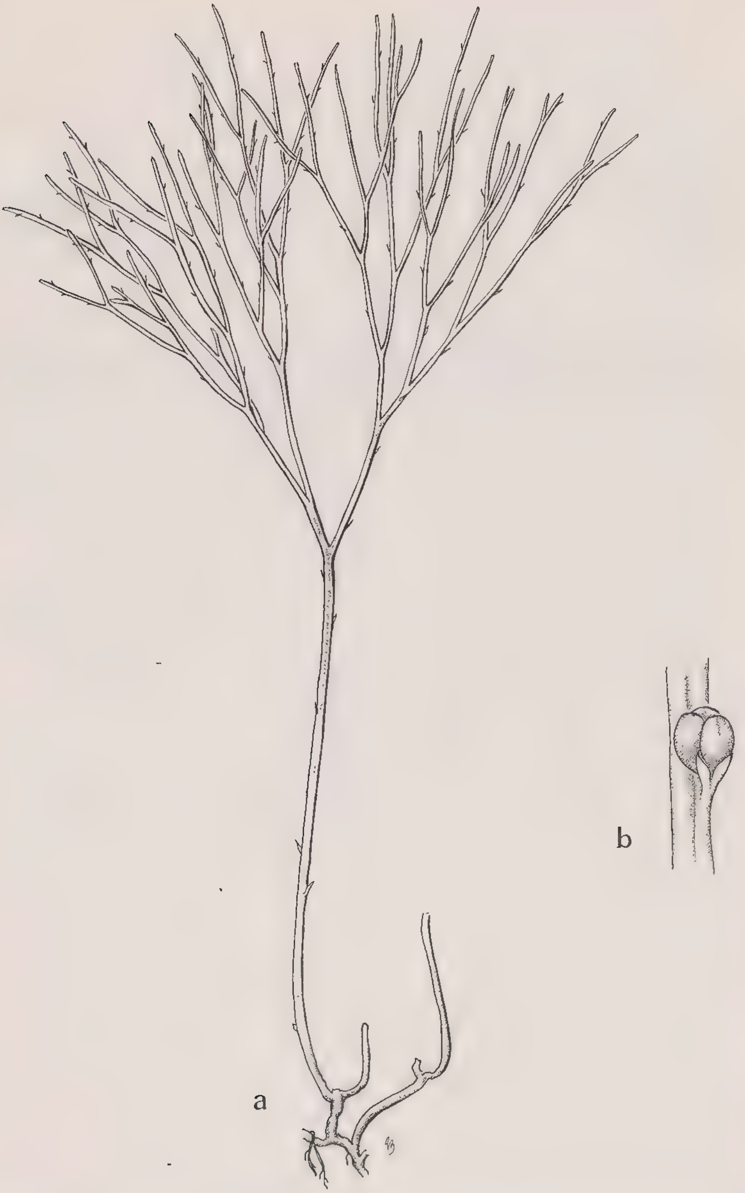

FIGURE 1. **Psilotum.** a, b, *P. nudum*: a, habit (sterile plant), × 0.5; b, section of fertile plant showing trilobed sporangium and bifid appendage, × 3.0.

Psilotum floridanum Michx., Fl. Bor. Amer. 2: 281. 1803. (Type from Florida.)

Bernhardia antillarum K. Müller in Bot. Zeit. 14: 234. 1856. (Syntypes from Jamaica, Martinique, and Trinidad.)

The names used by Swartz and Willdenow were based on the same Linnaean type as the accepted name for this species.

Plants chiefly erect or ascending, 20–60 cm. long, the main stalk 2–4 mm. thick. Branches more or less triquetrous. Leaves remote, triangular-subulate, 1–2(–3) mm. long. Sporangia ca. 2 mm. broad, yellow or brownish.

GENERAL DISTRIBUTION: Pantropical.

DISTRIBUTION IN LESSER ANTILLES: St. Barthelemy, Saba, St. Kitts, Nevis, Redonda, Montserrat, Guadeloupe, La Desirade, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Epiphytic, on stumps and old logs, in crevices of old masonry, or occasionally in crevices of cliffs or on ledges, rarely in soil on the ground.

CLASS II. LYCOPSIDA

Key to Families

1. Plants homosporous; leaves without ligules .... 1. Lycopodiaceae
1. Plants hetersporous; leaves with a ligule near the axil .. 2. Selaginellaceae

Family LYCOPODIACEAE

Terrestrial or epiphytic plants of erect, trailing, or pendent habit. Stems simple or branched, densely clothed nearly throughout with numerous small, simple, 1-nerved leaves, these all similar in some species, or dimorphic in others. Sporophylls like the other leaves or else modified and aggregated to form compact spikes (strobiles). Sporangia axillary, 1-loculed; spores all alike, minute, very numerous. Gametophytes fleshy or tuberous, with or without chlorophyll, monoecious.

As treated here, this family consists of two living genera; of these, *Phylloglossum* with one species occurs only in Australia. The other is *Lycopodium*, a large and diverse group of worldwide distribution. Some authors have divided this taxon into two or more genera, but the present writer does not feel they are sharply enough differentiated to be separated as genera. In this case, recognition of morphological groups as subgenera seems adequate to satisfy the requirements of classification. This opinion is in agreement with Wilce (1972), who says, "The case for dividing *Lycopodium* into splinter genera is not strong enough. The discontinuities between the species groups are not as great as some authors have suggested. To leave the genus intact is not a move that obscures the phylogenetic relationships between its members — these are approachable as it is. To divide the genus certainly adds nothing to our understanding of it. Finally, to leave *Lycopodium* whole is to maintain a genus that anyone can recognize at a glance, an attribute not to be discarded lightly."

Special literature: Spring, Monographie de la Famille des Lycopodiacees 1, in Mém. Acad. R. Belg. **15**: 1–110. 1842; 2, in Mém. Acad. R. Belg. **24**: 1–358. 1850; Underwood & Lloyd. The species of *Lycopodium* of the American tropics, in Bull. Torrey Bot. Club **33**: 101–124. 1906; Herter, Beiträge zur Kenntnis der Gattung *Lycopodium*–Studien über die Untergattung *Urostachys*, in Engl. Bot. Jahrb. **43**(Beibl. 98): 1–56, *t. 1–3, figs. 1–4.* 1909; Herter, Die Urostachys-Arten der Antillen, in Repert. Sp. Nov. **19**: 161–170. 1923; Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 510–516. 1926; Eames, Morphology of Vascular Plants, Lower Groups, pp. 1–30. 1936; Nessel, Die Bärlappgewachse, 404 pp., *87 figs.* 1939 (Nessel's publication, the only modern comprehensive work on this family, is so full of inaccuracies as to be almost unusable); Wilce, Lycopod spores, I. General spore patterns and the generic segregates of *Lyco-*

podium, in Amer. Fern J. 62: 65–79. 1972; Øllgaard, Studies in Lycopodiaceae, I. Observations on the structure of the sporangium wall, in Amer. Fern J. 65: 19–27, *25 figs.* 1975.

LYCOPODIUM Linnaeus

Lycopodium L., Sp. Pl. 2: 1100. 1753. FIGURE 2.

Characters as given for the family; plants perennial, with elongate stems; leaves arranged in 4–24 ranks or more. Spores various, ranging from nearly smooth to foveolate, more or less ridged and reticulate, or rarely spinose.

TYPE SPECIES: *Lycopodium clavatum* L., widespread in north-temperate regions and on tropical American mountain tops.

A genus of more than 400 species when construed in a broad sense, the majority in temperate regions and on tropical mountains. The present writer accepts a subdivision of this taxon into three subgenera in dealing with the species occurring in the Lesser Antilles.

KEY TO THE SUBGENERA

a. Plants terrestrial, or epiphytic and often pendent; stems simple or divided dichotomously into branches of more or less equal but indeterminate length; sporangia borne in the axils of unmodified or shortened leaves; spore walls pitted or grooved .... Subg. *Urostachya*[2]

a. Plants always terrestrial; stems creeping and more or less elongate, giving forth erect determinate lateral branches; sporangia borne in distinct strobiles (these essentially circular in cross-section); spore walls undulate, ridged, or crested.

  b. Erect branches with few dichotomous divisions, these of unequal length; spores ornamented with thin sharp ridges joined to form a reticulum .... Subg. *Lycopodium*

  b. Erect branches either simple and terminating in a single erect strobile, or else with numerous lateral branches variously subdivided, some terminating in small deflexed strobiles; spore walls undulate to ridged, the ridges curved, rounded on top, and anastomosing ...... Subg. *Lepidotis*

Subgenus UROSTACHYA

KEY TO THE SPECIES

a. Sporophylls similar to the sterile leaves, or, if contracted, not forming an abruptly contrasting fertile section.

  b. Plants terrestrial, stiffly ascending or erect (rarely decumbent); stems (excluding leaves) usually 1.5–3 mm. thick.

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[2] "*Urostachya*" was the original spelling used by Pritzel when publishing the name (in Engler & Prantl, Nat. Pflanzenfam. 1(4): 563. 1900). Herter altered the spelling to "*Urostachys*" (in Engl. Bot. Jahrb. 43(Beibl. 98): 1–56. 1909), and this change has been followed in subsequent publications which accepted the name. However, I can find no valid reason for Herter's "correction" and, in accordance with the *International Rules of Botanical Nomenclature*, have retained Pritzel's original spelling.

c. Leaves in more than 12 ranks and mostly more than 6 mm. long; stems rigidly erect.
  d. Divisions (including leaves) mostly 1.5–2 cm. in diameter; leaves in about 20 ranks, 1–1.2 mm. broad at base . . . . 1. *L. sieberianum*
  d. Divisions (including leaves) less than 1.5 cm. in diameter; leaves in 12–16 ranks, 0.6–0.8 mm. broad at base . 2. *L. reflexum*
c. Leaves in 8–10 ranks, 3–5 mm. long; stems lax and flaccid, decumbent or ascending . . . . 3. *L. intermedium*

b. Plants usually epiphytic, often of pendent habit.
  e. Leaves 0.5 mm. broad or less, almost hairlike.
    f. Stems (excluding leaves) 1.5–2 mm. thick, arcuate-spreading; leaves 8–18 mm. long . . . . 7. *L. wilsonii*
    f. Stems (excluding leaves) 0.2–0.5 mm. thick, more or less laxly pendent (at least when well developed); leaves 2–8(–12) mm. long . . . . 4. *L. verticillatum*
  e. Leaves 1–3.5 mm. broad, distinctly flat.
    g. Divisions cordlike, the leaves rigidly appressed or incurved . . . . 8. *L. funiforme*
    g. Divisions not cordlike, the leaves more or less spreading.
      h. Stems (excluding leaves) less than 1.5 mm. thick, laxly pendent or flaccid; sporangia 1–1.6 mm. broad.
        i. Leaves 6–9 mm. long, 1–1.5 mm. broad above the middle, irregularly 4–6-ranked, remote . . . . 5. *L. tenuicaule*
        i. Leaves 12–25 mm. long (less in a rare variety), 1.5–3.5 mm. broad below the middle, spirally 6-ranked . . . . 6 *L. linifolium*
      h. Stems (excluding leaves) 1.5–4 mm. thick, more or less stiffly decurved-spreading, rarely lax.
        j. Leaves 1–1.5 mm. broad . . . . 9. *L. dichotomum*
        j. Leaves 2–3 mm. broad . . . . 10. *L. taxifolium*

a. Sporophylls much contracted, arranged in a more or less elongate taillike appendage terminating sterile divisions, the whole plant laxly pendent . . . . 11. *L. aqualupianum*

1. **Lycopodium sieberianum** Spring, Monog. Lyc. **1**: 23. 1842, excl. syn.

Type: Martinique, *Kohaut, Sieber Exsicc. 56* (B).

Syn.: *Lycopodium reflexum* sensu Griseb., Fl. Br. W. Ind. 647. 1864, in part, not Lam.
Urostachys sieberianus (Spring) Herter in Repert. Sp. Nov. **19**: 162. 1923.
Huperzia sieberiana (Spring) Rothmaler in Repert. Sp. Nov. **54**: 60. 1944.

Plants terrestrial, stiffly erect from a curved base, 25–75 cm. long, simple or 1- to 2-times dichotomous, the divisions erect and equally thick throughout, sporangiate chiefly in the upper part. Stems rigid and subwoody when dry, 2–3 mm. thick (excluding leaves), or up to 2 cm. broad including the leaves, dark olive-green. Leaves densely crowded, stiff, ascending or spreading, spirally arranged in about 20 close ranks,

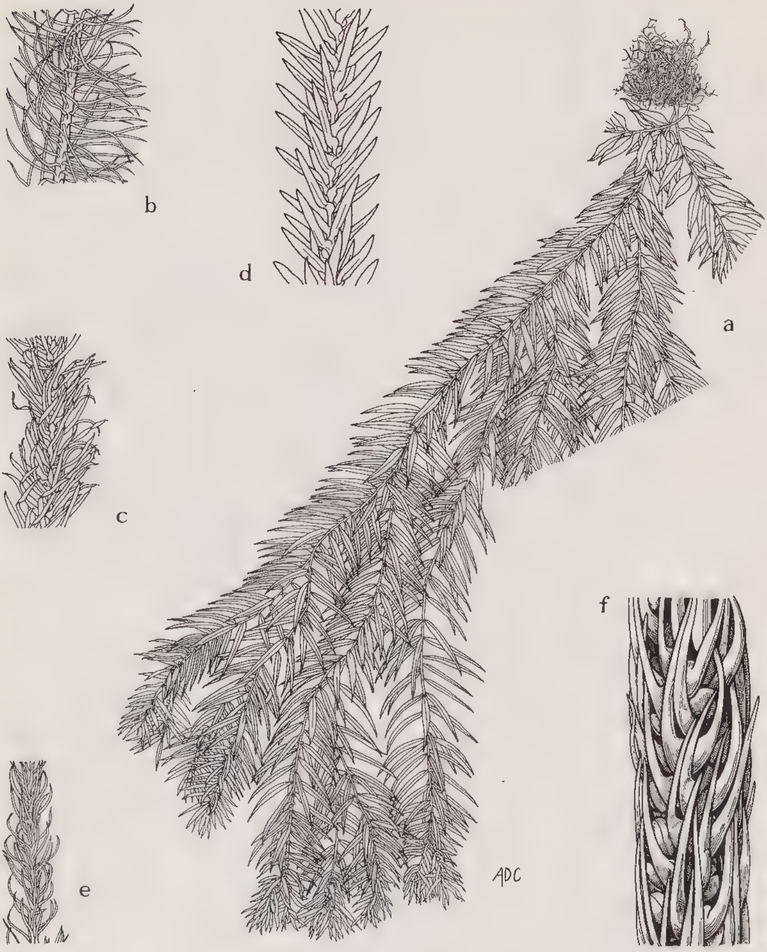

FIGURE 2. **Lycopodium.** a, *L. linifolium*: habit, × 0.4. b, c, *L. dichotomum*: b, section of stem with leaves, specimen from St. Lucia, × 0.8; c, section of stem with leaves, specimen from Dominica, × 0.8. d, *L. taxifolium*: section of stem with leaves, × 0.8. e, *L. setaceum*: section of stem with leaves, × 1.5. f, *L. funiforme*: section of stem with leaves, × 3.2.

subulate, 7–12 mm. long, 1–1.2 mm. broad at base (rarely narrower), nearly entire or very remotely denticulate, broadly ridged and decurrent beneath. Sporophylls like the sterile leaves. Sporangia to 1.3 mm. broad, roundish-reniform or nearly orbicular with a small sinus.

General Distribution: Probably endemic to the Lesser Antilles; reported from Haiti by Herter, but no material from there has been seen by the present writer. Large specimens of *Lycopodium reflexum* var. *rigidum* might be confused with this species.

Distribution in Lesser Antilles: St. Kitts (reported by Underwood & Lloyd), Martinique, St. Vincent.

Habitat: Confined to the summits of volcanic peaks, growing in exposed, cloud-dampened volcanic cinders. It is common about the crater of Mt. Pelée, Martinique, which is undoubtedly the type locality.

2. **Lycopodium reflexum** Lam., Encycl. Méth. Bot. 3: 653. 1789; Griseb. Fl. Br. W. Ind. 647. 1864, in part, excl. syn. *L. sieberianum.*

Type: *Joseph Martin s.n., Herb. Lamarck no. 442*, Martinique (P).
Syn.: *Lycopodium squarrosum* Sw., Prodr. 137. 1788, not Forst. 1786.
Plananthus reflexus (Lam.) Beauv., Prodr. Aethéog. 100. 1805.
Lycopodium rigidum sensu Sw., Syn. Fil. 176. 1806, in part, not J. F. Gmel. in L., Syst. Nat. ed. 13, 2: 1289. 1791.
Lycopodium reflexum Willd. in L., Sp. Pl. 5: 52. 1810. (Based on a different type.)
Lycopodium eversum Poir. in Lam., Encycl. Méth. Bot. Suppl. 3: 556. 1813. (Based on *L. reflexum* Willd. not Lam.)
Urostachys reflexus (Lam.) Herter in Beih. Bot. Centr. 39: 249. 1922.
Huperzia reflexa (Lam.) Rothmaler in Repert. Sp. Nov. 54: 60. 1944.

Plants terrestrial, erect, or ascending from a decumbent base, stiff, 10–45 (rarely to 70) cm. long, 1- to 3-times dichotomous, the divisions erect and of equal thickness throughout, sporangiate nearly to the base. Stems somewhat tumid in life, rigid when dry, 2–3(–5) mm. thick (excluding leaves), or 8–15 mm. broad including leaves, light- or yellowish-green. Leaves crowded, ascending or somewhat reflexed, spirally arranged in 12–16 close ranks, subulate, 6–10 mm. long, 0.6–0.8 mm. broad at base, more or less denticulate or stiffly ciliolate throughout (sometimes nearly entire in var. *rigidum*), flat on both sides, short-decurrent. Sporophylls like the leaves. Sporangia oblong-reniform, with a small, shallow sinus.

Two varieties occur in the Lesser Antilles, which can be distinguished as follows:

a. Leaves reflexed-spreading (at least the lower ones), always denticulate or ciliolate; sporangia 1–1.2 mm. broad .... 2a. var. *reflexum*
a. Leaves always rigid-ascending, denticulate or sometimes nearly entire; sporangia 1.5–1.8 mm. broad .... 2b. var. *rigidum*

2a. Lycopodium reflexum var. reflexum.

General Distribution: Greater Antilles, continental tropical America from Mexico to Paraguay and Bolivia.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: On banks and mossy ledges at middle to higher elevations.

2b. Lycopodium reflexum var. rigidum (J. F. Gmel.) Proctor in Rhodora 68: 464. 1966.

Basionym: *Lycopodium rigidum* J. F. Gmel. in L., Syst. Nat. ed. 13, **2**: 1289. 1791.

Lectotype: Dillenius, Hist. Musc. *t. 57*, *fig. 4* (copied from Plumier, Tr. Foug. *t. 166*, *fig. A*, probably based on a specimen from Hispaniola).

Distinguishing characters as indicated in the key; stems (excluding leaves) sometimes to 5 mm. thick.

General Distribution: Jamaica, Hispaniola.

Distribution in Lesser Antilles: Guadeloupe, Martinique, St. Vincent.

Habitat: Exposed mossy banks and low thickets at high elevations.

3. Lycopodium intermedium Spring in Mart., Fl. Bras. 1(2): 111. 1840; Monog. Lyc. 1: 27. 1842.

Syntypes: *Freyreiss s.n.*, *Sellow s.n.*, stated to have been collected near Rio de Janeiro, Brazil.

Syn.: *Lycopodium reflexum* var. *intermedium* (Spring) Baker, Fern Allies 11. 1887.

Urostachys intermedius (Spring) Herter in Repert. Sp. Nov. **19**: 163. 1923.

Huperzia intermedia (Spring) Rothmaler in Repert. Sp. Nov. **54**: 60. 1944.

Plants terrestrial, decumbent to ascending, or suberect from a decumbent base, 25–50 cm. long, 2- to 6-times dichotomous, the divisions of equal thickness throughout, sparsely to densely sporangiate chiefly toward the apices. Stems rather lax, flaccid, 1.5–2 mm. thick (excluding leaves), or 5–8 mm. broad including the leaves. Leaves crowded, softly herbaceous, strongly recurved or reflexed, spirally or subverticillately arranged in 8–10 ranks, subulate, 3–5 mm. long, 0.4–0.7 mm. broad near the base, entire, flat on both sides, the midrib evident or concealed, decurrent. Sporophylls like the sterile leaves. Sporangia orbicular, 1–1.1 mm. broad.

General Distribution: South America.

Distribution in Lesser Antilles: Guadeloupe (rare).

Habitat: Not stated.

4. **Lycopodium verticillatum** L. f., Suppl. Pl. 448. 1781; Griseb., Fl. Br. W. Ind. 647. 1864.

Type: *Sonnerat s.n.*, from the island of Réunion.
Syn.: *Lycopodium setaceum* Lam., Encycl. Méth. Bot. 3: 653. 1789. (Type from Réunion.)
Lycopodium acerosum Sw., Fl. Ind. Occ. 3: 1575. 1806. (Lectotype: Plumier, Tr. Foug. *t. 166, fig. B.*)
Lycopodium portoricense L. M. Underw. & Lloyd in Bull. Torrey Bot. Club 33: 108. 1906.
Urostachys verticillatus (L. f.) Herter in Beih. Bot. Centr. 39: 249. 1922.
Urostachys portoricensis (L. M. Underw. & Lloyd) Herter in Repert. Sp. Nov. 19: 163. 1923.
Urostachys acerosus (Sw.) Herter ex Nessel & Hoehne in Arch. Bot. São Paulo 1: 399. 1927.
Huperzia verticillata (L. f.) Rothmaler in Repert. Sp. Nov. 54: 60. 1944.

Plants epiphytic or sometimes on mossy banks and ledges, laxly pendent from an arcuate base, up to 80 cm. long, many times dichotomous, the divisions slender, usually flaccid, those of the terminal part discontinuously sporangiate. Stems 0.2–0.5 mm. thick (excluding leaves), or 2–12 mm. broad including leaves. Leaves delicately herbaceous, spirally arranged in 10–12 ranks, often appearing more or less in whorls of 5, ascending and imbricate or somewhat recurved-spreading, 3–6(–10) mm. long, the sterile ones linear-attenuate or subfiliform and 0.2–0.3 mm. broad at base, the sporophylls often slightly broader toward the base or (in densely fertile apical branches) shorter (ca. 2 mm.), lance-ovate, long-acuminate, excavate at base and partly concealing the sporangia. Sporangia suborbicular, 0.6–0.8(–1) mm. broad, with a shallow sinus. This description has been expanded to include the material usually called *Lycopodium portoricense*, with which there seems to be complete intergradation.

General Distribution: Greater Antilles, continental tropical America from Mexico to Brazil, Trinidad, tropical Africa and islands of the Indian Ocean. Related material from Malaya and Polynesia probably represents a different species.

Distribution in Lesser Antilles: Saba, Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Moist rain forests at middle to higher elevations. It should be noted that old plants under extreme conditions of shade and moisture develop long, finely attenuate branches that resemble the South American *Lycopodium tenue* Humb. & Bonpl. ex Willd.; such forms have given rise to reports of the latter species from Guadeloupe.

Most recent authors apply the specific name "setaceum" to the tropical American population of this species; however, the types of both *Lyco-*

podium verticillatum and *L. setaceum* were collected on Réunion Island in the Indian Ocean and are undoubtedly synonymous. If the New World population can be distinguished as a different species (which is highly doubtful), it apparently would have to bear the name *L. acerosum* Sw.

5. **Lycopodium tenuicaule** L. M. Underw. & Lloyd in Bull. Torrey Bot. Club 33: 113. 1906.

Type: *Lloyd 878,* from Morne Diablotin, Dominica (NY).
Syn.: *Urostachys tenuicaulis* (L. M. Underw. & Lloyd) Herter in Repert. Sp. Nov. 19: 165. 1923.

A lax, slender epiphyte with delicate scattered leaves, the stems mostly 20–30 cm. long, loosely 2- to 4-times dichotomous. Stems smooth, reddish, 0.3–0.7 mm. thick (excluding leaves), or 1–1.8 cm. broad including the leaves, the shoots dorsiventral by the twisting of the leaves at their bases. Leaves widely spreading, scattered, nearly all sporangiate except the oldest, narrowly elliptic or oblanceolate, 6–9 mm. long, 1–1.5 mm. wide above the middle, slightly asymmetrical and subfalcate, acute at the apex, the margins entire, the midrib slender, long-decurrent beneath, sharply carinate at base on upper side but scarcely evident beyond the middle of the leaf; tissue yellow-green, firmly herbaceous. Sporangia reniform, 1–1.3 mm. broad, ca. 0.8 mm. long with a deep sinus.

GENERAL DISTRIBUTION: Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe and Dominica; rare.

HABITAT: Pendent from the trunks of forest trees.

6. **Lycopodium linifolium** L., Sp. Pl. 2: 1100. 1753; Griseb., Fl. Br. W. Ind. 647. 1864.

Lectotype: Plumier, Tr. Foug. *t. 166, fig. C,* from an unspecified locality, either Martinique or Hispaniola.
Syn.: *Urostachys linifolius* (L.) Herter in Repert. Sp. Nov. 19: 165. 1923.
Huperzia linifolia (L.) Rothmaler in Repert. Sp. Nov. 54: 61. 1944.

A pendent, flaccid epiphyte, the stems to 60 cm. long, 2- to 8-times dichotomous, often densely aggregated, the divisions of equal breadth or (in old plants) the densely sporangiate apical divisions narrower and closely fasciculate. Stems 0.7–1.4 mm. thick (excluding leaves). Leaves thin-herbaceous, horizontal or oblique-spreading, subdistant, borne spirally in 6 ranks (but twisted at base so that the divisions appear somewhat flattened or dorsiventral), linear to lance-attenuate, straight or often more or less falcate, usually light yellow-green or pale green; costa prominent, decurrent beneath. Sporophylls like the leaves or shorter and ascending. Sporangia orbicular-reniform with a shallow sinus.

Two not very clear-cut varieties occur in the Lesser Antilles; these can usually be distinguished as follows:

a. Leaves 1.2–2.5 cm. long, 1.5–3.5 mm. broad; sporangia 1.2–1.6 mm. broad .... 6a. var. *linifolium*

a. Leaves less than 1 cm. long, and usually 0.5–1 mm. broad; sporangia 0.8–1 mm. broad .... 6b. var. *gracile*

6a. Lycopodium linifolium var. linifolium.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to Brazil.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Pendent from mossy trunks and branches of forest trees at chiefly middle elevations, in areas of high rainfall.

6b. Lycopodium linifolium var. gracile L'Herminier ex Fée, Mém. Fam. Foug. 11: 129. 1866.

Type: *L'Herminier s.n.*, from Guadeloupe. The holotype was presumably a specimen in Fée's personal herbarium.

Syn.: *Urostachya linifolia* var. *minor* Herter in Repert. Sp. Nov. **19**: 165. 1923. (Type: *Duss 4129*, from Guadeloupe.)

Urostachya linifolia var. *gracilis* Herter ex Nessel, Bärlappg. 161. 1939, excl. syn. *L. underwoodianum.*

General Distribution: Jamaica, Hispaniola, northern South America.

Distribution in Lesser Antilles: Guadeloupe, St. Lucia.

Habitat: Same as for var. *linifolium.*

7. Lycopodium wilsonii L. M. Underw. & Lloyd in Bull. Torrey Bot. Club 33: 111. 1906.

Type: *P. Wilson 271*, from the Luquillo Mts., Puerto Rico (NY).

Syn.: *Lycopodium trichodendron* Herter in Engl. Bot. Jahrb. **43**(Beibl. 98): 49. 1909. (Type from Guadeloupe.)

Lycopodium verticillatum sensu Boldingh, Fl. Dutch W. Ind. **1**: 11. 1909; Fl. Ned. W. Ind. 108. 1913, in part, not L. f.

Urostachya wilsonii (L. M. Underw. & Lloyd) Herter in Repert. Sp. Nov. **19**: 163. 1923.

Urostachya trichodendron (Herter) Herter in Repert. Sp. Nov. **19**: 163. 1923.

Plants epiphytic, 10–25 cm. long, arcuate-spreading or recurved from an erect base, 1- to 5-times dichotomous, the divisions more or less divergent, all but the lowest discontinuously sporangiate. Stems 1.5–2 mm. thick (excluding leaves), or 1.5–2.5 cm. broad including the leaves. Leaves spirally arranged in 10 ranks, wide-spreading, narrowly linear-attenuate (nearly filiform), 8–18 mm. long, 0.4–0.5 mm. broad near base, entire, concave on upper side, strongly keeled toward the decurrent base beneath. Sporophylls like the sterile leaves. Sporangia reniform, 1.5 mm. broad, 1.3 mm. long.

General Distribution: Jamaica, Puerto Rico, northern South America; reported from Costa Rica (as *Urostachya trichodendron*) by Nessel.

Distribution in Lesser Antilles: Saba, Guadeloupe, Martinique (?), St. Lucia, St. Vincent (?).

Habitat: Mossy trunks of trees in moist rain forests at middle elevations; plants rare.

8. **Lycopodium funiforme** Bory in Brongn., Hist. Veg. Foss. **2:** 10, 18, *t. 7, fig. 9.* 1837.

Type: Erroneously stated to have been collected in California by Chamisso; however, authentic material from the herbarium of Bory (P) was collected by L'Herminier in Guadeloupe.

Syn.: *Urostachya funiformis* (Bory) Herter in Repert. Sp. Nov. **19:** 163. 1923.
Huperzia funiformis (Bory) Rothmaler in Repert. Sp. Nov. **54:** 61. 1944.

A pendent epiphyte with cordlike, uniform stems reaching 2 m. in length, 1- to 4-times dichotomous, the apical divisions freely sporangiate. Stems 1.5–2 mm. thick (excluding leaves), or 4–7 mm. thick including the crowded leaves. Leaves spirally arranged in 14 or 16 ranks (or appearing whorled in 7's or 8's), rigidly ascending, incurved, subulate-attenuate, 8–11 mm. long, 1–1.5 mm. broad at base, entire, deeply concave on upper (adaxial) side, strongly convex beneath (the abaxial side appearing terete), sharply keeled at the decurrent base. Sporophylls like the sterile leaves. Sporangia cordate-orbicular or nearly so, ca. 1.5 mm. broad.

General Distribution: Greater Antilles and Guyana; reported from Costa Rica by Nessel.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

Habitat: Pendent from mossy tree trunks and stumps in moist forests at middle elevations.

9. **Lycopodium dichotomum** Jacq., Enum. Stirp. Vind. 314. 1762; Hort. Bot. Vind. 3: *26, t. 45.* 1776; Griseb., Fl. Br. W. Ind. 647. 1864, in part, excl. ref. *L. mandiocanum.*

Lectotype: Jacquin, Hort. Bot. Vind. 3: *t. 45*, which illustrates a plant from Martinique.

Syn.: *Lycopodium barbatum* Christ in Bull. Herb. Boiss. II, **5:** 254. 1905. (Type from Costa Rica.)
Lycopodium chamaepeuce Herter in Engl. Bot. Jahrb. 43(Beibl. 98): 50. 1909. (Type from Guadeloupe.)
Lycopodium taxifolium sensu Boldingh, Fl. Dutch W. Ind. **1:** 11. 1909; Fl. Ned. W. Ind. 108. 1913, in part, not Sw.

Urostachya dichotoma (Jacq.) Herter in Beih. Bot. Centr. **39**: 249. 1922.

Urostachya chamaepeuce (Herter) Herter in Repert. Sp. Nov. **19**: 164. 1923.

Urostachya chamaepeuce var. *urbaniana* Herter in Repert. Sp. Nov. **19**: 164. 1923. (Syntypes: *Broadway 3457* in part and *3458b* (both B), collected in Grenada.)

Urostachya barbata (Christ) Nessel, Bärlappg. 30. 1939.

Urostachya chamaepeuce var. *major* Herter ex Nessel, Bärlappg. 151. 1939, nomen illegit.

Urostachya chamaepeuce var. *maxima* Herter ex Nessel, Bärlappg. 151. 1939. (Based on a nonexistent basionym attributed to Fée.)

Huperzia dichotoma (Jacq.) Rothmaler in Repert. Sp. Nov. **54**: 61. 1944.

Plants epiphytic, mostly 20–50 cm. long, arching or pendent from an ascending, arcuate base, 2- to 6-times dichotomous, all branches of equal breadth or the densely sporangiate apical ones gradually narrower. Stems 2–4 mm. thick (excluding leaves), or 1–3(–4) cm. broad including the leaves. Leaves crowded, spirally arranged in 8 or 10 ranks, more or less spreading or ascending, linear-subulate, mostly 1–2 cm. long, 1–1.4 mm. broad near the base, subfalcate, entire, subconvex on the upper (adaxial) side, slightly concave beneath, keeled at the decurrent base. Sporophylls like the sterile leaves or shorter and more oblique, always narrower than the sporangia. Sporangia reniform, ca. 2 mm. broad, with a deep sinus.

General Distribution: Florida, Greater Antilles, Trinidad, continental tropical America from Mexico to Brazil.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On mossy branches of forest trees at middle elevations; plants not common.

10. **Lycopodium taxifolium** Sw., Prodr. 138. 1788; Fl. Ind. Occ. 3: 1573. 1806; Griseb., Fl. Br. W. Ind. 647. 1864.

Type: *Swartz*, collected in Jamaica.

Syn.: *Lycopodium herminieri* Spring in Bull. Acad. R. Bruxelles 8: 514. 1841. (Type from Guadeloupe.)

Lycopodium picardae Christ ex Krug in Engl. Bot. Jahrb. **24**: 148. 1897.

Lycopodium schwendenerii Herter in Engl. Bot. Jahrb. **43**(Beibl. 98): 50. 1909. (Type not cited.)

Urostachya taxifolia (Sw.) Herter in Repert. Sp. Nov. **19**: 162. 1923.

Urostachya herminieri (Spring) Herter in Repert. Sp. Nov. **19**: 162. 1923.

Urostachya schwendenerii (Herter) Herter in Repert. Sp. Nov. **19**: 165. 1923.

Urostachya picardae (Christ ex Krug) Herter in Repert. Sp. Nov. **19**: 166. 1923.

Urostachya taxifolia var. *herminieri* (Spring) Nessel, Bärlappg. 173. 1939.

Plants epiphytic, 20–50(–70) cm. long, mostly 2- to 6-times dichotomous, variable, stiffly arcuate-decurved (the divisions rigid and not reduced toward the tips) to loosely pendent with somewhat narrower, densely sporangiate apical divisions. Stems 1.5–4 mm. thick (excluding leaves), or 2–4 cm. broad in the lower part including the spreading leaves, often narrower above, the leaves becoming obliquely oriented. Leaves firm or stiff, usually close, spirally arranged in 6–8 ranks, lance-linear, attenuate to the sharp apex, 1.3–2 cm. long, 2–3 mm. broad above the base, entire and with concealed costa, keeled and decurrent at the base beneath (abaxial side). Sporophylls similar to the sterile leaves or else reduced (especially in pendent forms), with a somewhat enlarged concave base partly concealing the sporangia. Sporangia reniform, ca. 2 mm. broad, with a deep sinus.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On mossy stumps and trunks or branches of trees in moist forests at middle to higher elevations.

11. **Lycopodium aqualupianum** Spring, Monog. Lyc. **1**: 68. 1842.

Type: *L'Herminier s.n.*, from Guadeloupe.

Syn.: *Lycopodium phlegmaria β nummularifolium* sensu Griseb., Fl. Br. W. Ind. 647. 1864, not *L. nummularifolium* Blume.

Lycopodium guadalupianum Fée, Mém. Fam. Foug. **11**: 131, *t. 33, fig. 1.* 1866. (Fée's name was merely an attempt to correct Spring's epithet *"aqualupianum"*; it was based on the same type.)

Urostachya aqualupiana (Spring) Herter in Repert. Sp. Nov. **19**: 166. 1923.

Huperzia aqualupiana (Spring) Rothmaler in Repert. Sp. Nov. **54**: 62. 1944.

Plants epiphytic, pendent, flaccid, 20–60 cm. long, dichotomously branched, the stems dimorphic with a leafy, sterile basal portion, the branches abruptly contracted to slender, lax, more or less elongate fertile tips. Sterile stems 1–1.5 mm. thick (excluding leaves), or flattened and 1–2 cm. wide including the leaves. Leaves spirally arranged in 4 ranks (but twisted at base so that the stem as a whole is somewhat dorsiventral), obliquely spreading, broadly elliptic, 6–11 mm. long, 3–4.5 mm. broad, more or less acute at the apex, obliquely attached at the acute, decurrent base, flat, with entire, slightly cartilaginous margins, and with a distinct midrib prominent beneath. Fertile stems 5–35 cm. long, repeatedly branched, the divisions quadrangular and 1.5–2 mm. thick (including the sporophylls). Sporophylls closely imbricate, ovate-acuminate, mostly 2–3 mm. long, sharply keeled to the incurved apex, deeply concave on the adaxial side and concealing the sporangia. Sporangia round-reniform, ca. 1.5 mm. broad, with a deep sinus.

General Distribution: Greater Antilles except Jamaica; Guatemala, northeastern South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique(?), St. Lucia, St. Vincent(?).

Habitat: Hanging from mossy trunks and branches of forest trees in moist localities at chiefly middle elevations; plants not common.

Subgenus LYCOPODIUM

12. Lycopodium clavatum L., Sp. Pl. 2: 1101. 1753; Griseb., Fl. Br. W. Ind. 646. 1864.

Type: linn *1257.2*, from northern Europe (probably Sweden).
Syn.: *Lepidotis clavata* (L.) Beauv., Prodr. Aethéog. 108. 1805.
Lycopodium aristatum Humb. & Bonpl. ex Willd. in L., Sp. Pl. 5: 17. 1810. (Type from Venezuela.)
Lycopodium trychophyllum Desv. in Mém. Soc. Linn. Paris 6: 184. 1827. (Type from Brazil.)
Lycopodium aristatum var. *β incurvum* Grev. & Hook. in Bot. Misc. Hooker 2: 376. 1831. (Type: *Sieber, Fl. Mixta 327* (k).)
Lycopodium aristatum var. *γ robustius* Grev. & Hook. in Bot. Misc. Hooker 2: 376. 1831.
Lycopodium trichiatum sensu Spring, Monog. Lyc. 1: 91. 1842; 2: 43. 1850, in part, with regard to West Indian citations, (? not Bory, Voy. Mers. Afr. 1: 350. 1804.).
Lycopodium trichiatum var. *desvauxianum* Spring, Monog. Lyc. 1: 92. 1842.
Lycopodium clavatum var. *trychophyllum* (Desv.) Nessel & Hoehne in Arch. Bot. São Paulo 1: 436. 1927.
Lycopodium clavatum var. *desvauxianum* (Spring) Nessel & Hoehne in Arch. Bot. São Paulo 1: 436. 1927.
Lycopodium clavatum var. *aristatum* (Humb. & Bonpl. ex Willd.) Nessel & Hoehne in Arch. Bot. São Paulo 1: 439. 1927.
Lycopodium clavatum var. *aristatum* f. *incurvum* (Grev. & Hook.) Nessel, Bärlappg. 305. 1939.
Lycopodium clavatum var. *aristatum* f. *robustius* (Grev. & Hook.) Nessel, Bärlappg. 306. 1939.

Plants terrestrial, with wide-creeping, arched or rampant leafy stems rooting at intervals, bearing distant, erect and rigid or ascending and lax, subpinnately or irregularly forked branches 10–25 cm. long, some of these ending in short or elongate, finely bracteate, erect peduncles, the latter simple or usually forked once or twice, the branches terminating in solitary cylindric strobiles. Main stems reaching several meters in length, cylindric, 2–2.5 mm. thick (excluding leaves), sparsely or densely clothed with ascending, lance-linear, attenuate, hair-pointed denticulate leaves, these 4–7 mm. long and 0.5–1 mm. broad. Leaves of erect branches of similar dimensions but with entire margins, spreading or rigidly upcurved and imbricate. Unbranched basal portion 1–12 cm. long, bearing subremote, acicular, rigidly ascending leaves. Strobiles 2–5.5 cm.

long; sporophylls ovate-acuminate with spreading, hair-pointed apex, 2–3.5 mm. long, 0.8–1.2 mm. broad. Sporangia cordate-reniform, ca. 1 mm. broad, concealed by base of sporophyll.

GENERAL DISTRIBUTION: Nearly worldwide in suitable habitats.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Martinique.

HABITAT (LOCAL): Exposed summits and in craters of volcanic mountains.

Subgenus LEPIDOTIS

KEY TO THE SPECIES

a. Erect branches simple, terminating in a single erect strobile 2.5–8 cm. long; leaves of creeping stems dimorphic .... 13. *L. carolinianum*

a. Erect branches of miniature treelike habit, several or many divisions terminating in a deflexed strobile 0.4–2 cm. long; leaves not dimorphic .... 14. *L. cernuum*

13. **Lycopodium carolinianum** L., Sp. Pl. 2: 1104. 1753. var. **meridionale** (L. M. Underw. & Lloyd) Nessel & Hoehne in Arch. Bot. São Paulo 1: 431. 1927.

Basionym: *Lycopodium meridionale* L. M. Underw. & Lloyd in Bull. Torrey Bot. Club 33: 121. 1906.
Type: *P. Wilson 94*, from Puerto Rico (NY).

Plants terrestrial, the main stem prostrate, creeping, with short, alternate lateral branches of similar form and habit, these and the main axis bearing a few rigidly erect peduncles terminating in solitary cylindric strobiles. Stems 1–2 mm. thick (excluding leaves), or 7–15 mm. broad including the leaves, naked beneath. Leaves dimorphic, dorsiventral in arrangement, borne in 6 ranks (2 lateral, 4 upper), the lateral leaves oblique-spreading, decurved-falcate, 5–9 mm. long, 1.5–2.5 mm. broad, keeled-decurrent beneath; upper leaves oblique, lance-subulate, shorter and narrower than the lateral ones, mostly straight and with revolute margins. Unbranched basal portion 10–33 cm. long (excluding strobiles), terete, 1–1.5 mm. thick, remotely beset with minute, ascending, acicular leaves in about 10 ranks. Strobiles 2.5–8 cm. long; sporophylls narrowly rhombic, mostly 5–6 mm. long and up to 1.5 mm. broad, acuminate at both ends (the base adnate to the rhachis, the tips spreading with age), the margins erose-denticulate or sublacerate in the widest part. Sporangia cordate-reniform, 1–1.3 mm. broad.

GENERAL DISTRIBUTION: Greater Antilles, Belize(?), Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica.

HABITAT: Open savannas and similar moist situations at chiefly middle elevations.

Underwood and Lloyd separated their *Lycopodium meridionale* from *L. carolinianum* on the basis of "Sporangia depressed-renate; under [lateral] leaves ovate, acute" — *L. meridionale*; "Sporangia round-renate; under leaves lanceolate" — *L. carolinianum*. Examination of several populations suggests that these characters are not very distinct and do not warrant segregation at the species level.

14. Lycopodium cernuum L., Sp. Pl. 2: 1103. 1753.

Type: LINN *1257.13*, from an unknown locality. Much of the Linnaean concept of this species was based on literature pertaining to Ceylon and other parts of the Old World tropics; the tropical American population was represented among the Linnaean references by Plumier, Tr. Foug. *t. 165*, *fig. A*, which was based on a plant from either Martinique or Hispaniola.

Syn.: *Lepidotis cernua* (L.) Beauv., Prodr. Aethéog. 108. 1805.

Plants terrestrial, with horizontal-arching or assurgent main stems bearing several erect, plumose aerial branches, or sometimes the main stem itself erect, the lowermost branch decurved-spreading and stoloniferous; erect stems 30–100 cm. long, bearing numerous spreading, freely branched, densely leafy lateral divisions (giving the plant a miniature treelike appearance), the ultimate ones ending in sessile cylindric-conic strobiles. Leaves of main stems spirally arranged in 16–24 ranks, often appearing nearly whorled, subulate-attenuate, mostly entire, spreading or reflexed, keeled, and decurrent adaxially at the base. Lateral branches to 15 cm. long, bearing leaves similar to those of the main stems but slightly smaller and strongly upcurved. Strobiles often numerous, downwardly pointed in life; sporophylls appressed-imbricate, in about 10 ranks, deltate-acuminate. Sporangia subglobose with unequal valves, concealed.

Two rather distinct varieties occur in the Lesser Antilles. These could very well be considered separate species (and usually are) when viewed in the local context only; however, these populations belong to a complex of forms with various other representatives in different countries. Some of these, occurring outside the Lesser Antilles, seem to possess characters intermediate between those of the two Lesser Antillean forms. For this reason it seems better not to treat the Lesser Antillean populations as independent species. They can be distinguished as follows:

a. Main stems (excluding leaves) chiefly 2–3 mm. thick; leaves 3–4 mm. long, 0.2–0.4 mm. broad at the often hirtellous base; strobiles chiefly 0.4–1 cm. long (rarely more), 2–3 mm. thick; sporophylls ca. 2 mm. long, fimbriate-ciliate; sporangia 0.5–0.7 mm. thick .... 14a. var. *cernuum*

a. Main stems (excluding leaves) chiefly 3–6 mm. thick; leaves up to 5 mm. long or more, ca. 0.5 mm. broad at the glabrous base; strobiles mostly 1–2 cm. long, 3–4 mm. thick; sporophylls ca. 2.5 mm. long, irregularly denticulate; sporangia 0.7–0.8 mm. thick .... 14b. var. *dussii*

14a. Lycopodium cernuum var. cernuum

General Distribution: Pantropical.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Moist banks, sunny thickets, savannas, and borders of pastures and woodlands, at chiefly middle elevations.

14b. Lycopodium cernuum var. dussii Christ in Engl. Bot. Jahrb. 24: 147. 1897.

Type: *Duss 3739*, collected in Guadeloupe (B).

Syn.: *Lycopodium cernuum β curvatum* sensu Griseb., Fl. Br. W. Ind. 647. 1864, in part, as to ref. Dominica and St. Vincent, not *Lycopodium curvatum* Sw.

Lycopodium tortum Sieber ex L. M. Underw. & Lloyd in Bull. Torrey Bot. Club 33: 118. 1906. (Type from Martinique.)

Lycopodium cernuum var. *medium* sensu Herter ex Nessel, Bärlappg. 354. 1939, (? not C. Presl, 1825.).

Lycopodium cernuum var. *curvatum* sensu Nessel, Bärlappg. 354. 1939, in part, not *Lycopodium curvatum* Sw.

Lycopodium cernuum f. *durissimum* Herter ex Nessel, Bärlappg. 355. 1939, in part; lacking Latin description.

General Distribution: Probably endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: Amidst dwarf vegetation on the summits and in the craters of volcanic mountains; plants locally frequent.

It is possible that this taxon also occurs in South America, and that var. *medium* C. Presl is a synonymous (and earlier) name. The *Lycopodium cernuum* group as a whole needs taxonomic revision; it will not be possible to properly evaluate local variants until this is done.

Doubtful Records

Lycopodium guatemalense Maxon, cited by Herter (in Repert. Sp. Nov. 19: 165. 1923, as *Urostachya guatemalensis*) from Guadeloupe, is perhaps not separable from *L. linifolium*, at least so far as Antillean material is concerned. It is supposed to differ chiefly "in its red stems, lesser size, and more slender, strongly falcate leaves." Herter attributed this species to Haiti and Guadeloupe, but the Haitian material at least was regarded by the Danish pteridologist Christensen as merely a small, more flaccid form of *L. linifolium* (see his comment in Kongl. Sv. Vet. Akad. Handl. III, 16(2): 92. 1936); this would no doubt correspond with the var. *gracile* as treated in the present book. I have not seen the specimens from Guadeloupe on which Herter based his record, but suspect they may represent misidentified material of *Lycopodium tenuicaule.*

Lycopodium myrsinites Lam., cited by Grisebach (Fl. Br. W. Ind. 647, 648. 1864) from Dominica. The type of this species came from Hispaniola, but there has been much confusion about its circumscription and geographic range. It is closely related to *L. aqualupianum*, and might easily be mistaken for that species. The Brazilian plant wrongly called "*Urostachys myrsinites* (Lam.) Herter" by Nessel (Bärlappg. 134. 1939) is a completely different species. The present writer has seen no material of true *L. myrsinites* from the Lesser Antilles.

Family SELAGINELLACEAE

Terrestrial, minutely leafy plants of creeping or spreading habit; stems creeping, assurgent, or erect, often producing wiry rhizophores at some or many of the nodes, freely branched, the branches chiefly alternate. Leaves numerous, very small, 1-nerved, either (1) all alike and of spiral arrangement (subgenus *Selaginella*) or (2) dimorphic, dorsiventrally arranged in 2 planes of 2 rows each, those of the lower plane ("lateral leaves") usually spreading, those of the upper plane ("median leaves") smaller and mostly appressed antrorsely, at right angles to the lateral leaves (subgenus *Stachygynandrum*). Sporophylls borne in compact sessile spikes (strobiles) terminating the ultimate branches or in a very few cases differentiated strobiles not produced. Sporangia axillary to sporophylls, 1-loculed, producing either 1–4 relatively large triplanate megaspores or very numerous, minute, reddish or orange, powdery microspores. Gametophytes minute, developing chiefly within the spores.

A single, worldwide genus.

SELAGINELLA Beauvois

Selaginella Beauv. in Mag. Encycl. Paris **5**: 478. 1804, nom. cons. FIGURE 3.

Characters as given for the family.

TYPE SPECIES: *Selaginella selaginoides* (L.) Link, based on *Lycopodium selaginoides* L., of boreal regions.

A large genus of at least 600 species, the majority found in tropical and subtropical countries. In the Lesser Antilles are seven recorded species, two of these probably introduced but now thoroughly naturalized. All belong to subgenus *Stachygynandrum.*

SPECIAL LITERATURE: Spring, Monographie de la Famille des Lycopodiacees 2, in Mém. Acad. R. Belg. **24**: 52–358. 1850; Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 517–521. 1926; Alston, A revision of the West Indian species of *Selaginella*, in Bull. Brit. Mus. Bot. **1**(2): 27–47. 1952.

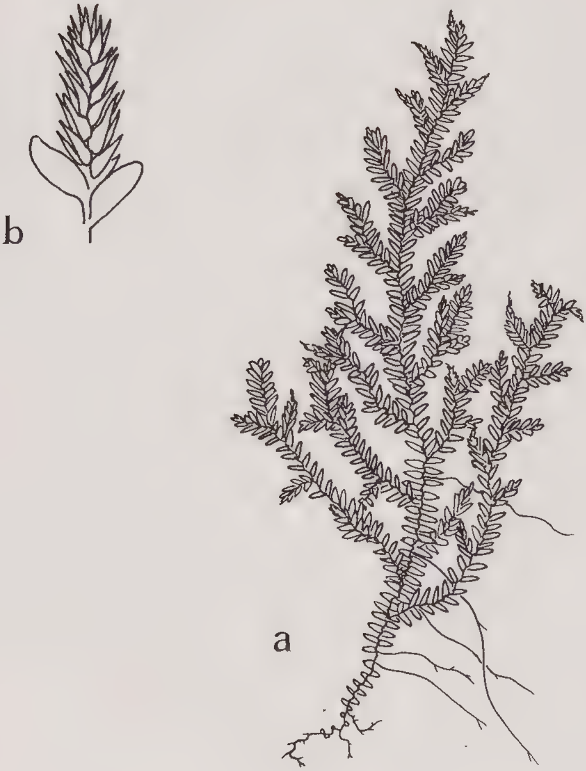

FIGURE 3. **Selaginella.** a, b, *S. tenella*: a, habit, × 1.0; b, section of stem showing median and lateral leaves, × 6.0.

KEY TO THE SPECIES

a. Main stems erect or suberect, rooting at base only.
  b. Erect stems red (Barbados) .... 1. *S. umbrosa*
  b. Erect stems not red.
    c. Mature stems 1–2 mm. thick, at least near the base.
      d. Leaves of erect stems uniform, more or less adpressed, directed upwardly.
        e. Lateral leaves ciliolate .... 2. *S. flabellata*
        e. Lateral leaves glabrous .... 3. *S. plana*
      d. Leaves of erect stems mostly dimorphic and spreading .... 4. *S. substipitata*
    c. Mature stems 0.5 mm. thick or less .... 5. *S. tenella*
a. Stems prostrate and usually rooting (by means of rhizophores) nearly throughout.
  f. Median leaves auriculate; lateral leaves obtuse or rounded at the apex .... 6. *S. serpens*
  f. Median leaves not auriculate; lateral leaves acute to acuminate.
    g. Mature stems 1–2 mm. thick, at least near the base .... 4. *S. substipitata*
    g. Mature stems 0.5 mm. thick or less.
      h. Lateral leaves ovate-oblong, acute, up to 2.5 mm. long .... 5. *S. tenella*
      h. Lateral leaves roundish-ovate, mucronate, mostly less than 1.5 mm. long .... 7. *S. rotundifolia*

1. **Selaginella umbrosa** Lemaire ex Hieron. in Engler & Prantl, Nat. Pflanzenfam. 1(4): 683, *fig. 404.* 1901.

Type: Not specified by Lemaire or Hieronymus, but the species may have been based on *Selaginella erythropus* var. *major* Spring in Mém. Acad. R. Belg. 24: 156. 1850, the type of which is *Skinner s.n.*, from Guatemala (K).

Syn.: *Selaginella erythropus* sensu Jenman, Ferns Br. W. Ind. 401. 1909, not Spring.
Selaginella lemairei Hieron. in Hedwigia 58: 287. 1917.

Plants stoloniferous; erect main stems 5–25 cm. long before branching, this portion (including the leaves) bright rose-red or red-purple, with leaves all similar and appressed-ascending. Branched portion irregularly and densely flabellate, 10–25 cm. long and about as wide, mostly green. Lateral leaves of main branches 1.5–2 mm. long (smaller toward ends of branches), 0.8–1 mm. broad, ovate-falcate, the margins strongly ciliolate toward the inequilateral base; median leaves ovate-acuminate, lightly keeled. Fertile spikes (strobiles) numerous, 3–20 mm. long; sporophylls ovate-acuminate, sharply keeled, ciliolate, ca. 1 mm. long.

GENERAL DISTRIBUTION: Tobago, continental tropical America from Mexico to Colombia and Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Barbados.

HABITAT: Moist wooded slopes at medium elevations; plants rare. It is not clear whether this is an indigenous plant in Barbados, or whether it was introduced and has become naturalized. The natural range of this species does not preclude the first alternative.

2. **Selaginella flabellata** (L.) Spring in Flora (Regensburg) 21: 198. 1838.

Basionym: *Lycopodium flabellatum* L., Sp. Pl. 2: 1105. 1753.
Lectotype: Plumier, Descr. Pl. Amer. *t. 24, fig. a*, based on a plant from Fort St. Pierre, Martinique.

Plants stoloniferous; erect main stems 8–45 cm. long before branching, yellowish-green with dark green leaves. Branched portion irregularly flabellate, up to 30 cm. long, the branches rather lax. Lateral leaves of main branches mostly 2–4 mm. long, up to 2 mm. broad, ovate, acute, somewhat falcate, the margins ciliolate toward the base; median leaves ovate-acuminate, strongly inequilateral, faintly keeled. Strobiles often numerous, mostly 5–25 mm. long; sporophylls ovate-acuminate, keeled, ciliolate at base, minutely denticulate above, 1–1.3 mm. long.

GENERAL DISTRIBUTION: Probably endemic to the Lesser Antilles; a single collection has been seen from Haiti, *Picarda 1151* (IJ), but this disjunct record needs further confirmation.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Wooded slopes at medium elevations; plants common.

3. **Selaginella plana** (Desvaux) Hieron. in Engler & Prantl, Nat. Pflanzenfam. 1(4): 703. 1901.

Basionym: *Lycopodium planum* Desvaux ex Poiret in Lam., Encycl. Méth. Bot. Suppl. 3: 554. 1814.
Type: ex *Herb. Desvaux*, from an unspecified East Indian locality (P).

Plants becoming rampant by extensive, widely branching stoloniferous stems. Erect stems pale greenish or straw-colored, 20–50 cm. long, usually producing branches nearly throughout, these widely spaced, alternate, stalked, 7–11 cm. long, loosely or densely pinnate-subflabellate. Lateral leaves on main axis of branches wide-spreading, 2–5 mm. long, up to 2 mm. broad, ovate-oblong, auriculate at base on acroscopic side, acute; median leaves ovate-lanceolate, acuminate. All leaves glabrous and entire. Strobiles elongate, flexuous, up to 4.5 cm. long; sporophylls ovate-acuminate, ca. 1.5 mm. long, the margins scarious-sclerotic and denticulate.

GENERAL DISTRIBUTION: Southeast Asia and Indonesia; naturalized elsewhere.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts and Barbados; introduced and naturalized.

HABITAT: Moist banks and gullies at lower to medium elevations.

4. **Selaginella substipitata** Spring in Bull. Acad. R. Bruxelles 10(1): 227. 1843.

Type: *Beaupertuis s.n.*, from Guadeloupe.
Syn.: *Selaginella portoricensis* A. Braun in Ann. Sci. Nat. Sér. V, Bot. 3: 288. 1865. (Type from Puerto Rico.)
Selaginella stolonifera sensu Husnot, Cat. Crypt. Antill. Franc. 58. 1870, not Spring.
Selaginella sherringii Hieron. in Hedwigia **58**: 326. 1917. (Type from Grenada.)

Main stems 15–30 cm. long, 1–2 mm. thick, assurgent or suberect, the semiprostrate base bearing stout rhizophores 4–10 cm. long. Lateral branches laxly oblique-spreading, the larger ones 5–10 cm. long. Lateral leaves of the main stem and chief branches widely separated, 3–4.5 mm. long, 1.5–2.5 mm. broad; median leaves mostly 2.5–3 mm. long, keeled, ovate, acuminate-cuspidate. All leaves with margins minutely denticulate-ciliolate. Strobiles 4–10 mm. long, the sporophylls ovate-acuminate, rigidly denticulate, up to 2.5 mm. long.

GENERAL DISTRIBUTION: Hispaniola, Puerto Rico, Trinidad, perhaps northern South America; Alston has stated that *Selaginella karsteniana* A. Braun and *S. rigida* Baker may be synonymous.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: In moist shaded humus at medium to higher elevations; plants often common and forming a ground cover.

5. **Selaginella tenella** (Beauv.) Spring in Bull. Acad. R. Bruxelles 10(1): 234. 1843.

Basionym: *Diplostachyum tenellum* Beauv. in Mag. Encycl. Paris **9**(5): 481. 1804; Prodr. Aethéog. 104. 1805.
Type: None cited with the original description, and none cited by Alston.
Syn.: *Lycopodium tenellum* (Beauv.) Desvaux ex Poiret in Lam., Encycl. Méth. Bot. Suppl. 3: 553. 1814.
Selaginella albo-nitens Spring in Bull. Acad. R. Bruxelles **10**(1): 139. 1843.
Selaginella mollis Fée, Mém. Fam. Foug. **11**: 133, *t. 34, fig. 1.* 1866, not A. Braun, 1865. (Type from Guadeloupe.)

Main stems 5–14 cm. long, usually decumbent (or the apical part suberect), 0.2–0.5 mm. thick, producing capillary rhizophores from the lower nodes; branched nearly throughout. Lateral branches mostly 1–3 cm. long (rarely more), the larger with 2–3 short divisions. Lateral leaves of main stem and branches 2–3 mm. long, 0.8–1.5 mm. broad, elliptic-oblong to ovate-oblong, somewhat acute, inequilateral, the margins more or less ciliolate or denticulate, the tissue fragile, pale green and pellucid; median leaves mostly 1.5–2.2 mm. long, obovate, abruptly acuminate-aristate, the margins ciliolate. Strobiles mostly 2–5 mm. long; sporophylls 1–1.3 mm. long, keeled, the margins rigidly denticulate.

GENERAL DISTRIBUTION: Greater Antilles. Closely related to *Selaginella cladorrhizans* A. Braun of Trinidad and Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, St. Lucia, St. Vincent.

HABITAT: On moist shaded rocks, ledges, or cliffs, also on mossy earth banks and occasionally on mossy tree trunks, at chiefly middle elevations.

6. **Selaginella serpens** (Desvaux) Spring in Bull. Acad. R. Bruxelles 10(1): 228. 1843.

Basionym: *Lycopodium serpens* Desvaux ex Poiret in Lam., Encycl. Méth. Bot. Suppl. 3: 553. 1814.
Type: ex *Herb. Desvaux*, collected in Jamaica (P).

Stems creeping, the plants often closely intermixed to form extensive mats; individual stems mostly 5–20 cm. long, producing single capillary rhizophores at most of the nodes. Lateral branches alternate, distant, relatively short, with 1–6 alternate secondary branchlets. Lateral leaves of main stems 1.5–2 mm. long, 0.8–1.2 mm. broad, ovate, cordate and ciliate at base; median leaves to 1.5 mm. long, ovate-acuminate, broadly auriculate on the basiscopic side, the margins ciliate. Strobiles mostly 3–10 mm. long; sporophylls ca. 1 mm. long, sharply acuminate, keeled, the margins denticulate.

GENERAL DISTRIBUTION: Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, Barbados.

HABITAT: Rocky ledges or earth banks in light or partial shade, at lower to middle elevations.

7. **Selaginella rotundifolia** Spring in Bull. Acad. R. Bruxelles 10(1): 139. 1843.

Type: *Beaupertuis s.n.*, from Guadeloupe.
Syn.: *Selaginella rotundifolia* var. *β denticulata* Spring in Nouv. Mém. Acad. Bruxelles 24: 86. 1849. (Type from Guadeloupe.)

Stems filiform, 5–15 cm. long, intricately creeping, producing hairlike rhizophores from the nodes. Branches few, distant, alternate, each with a few, distant, simple divisions 2–3 mm. long. Lateral leaves of stem and main branches mostly 0.8–1(–1.5) mm. long, up to 1.1 mm. broad, very broadly ovate, rounded-subcordate at base, with minutely and distantly denticulate margins; tissue bright green, delicate, pellucid; median leaves narrowly ovate-acuminate, mostly 0.5–0.8 mm. long, minutely denticulate-ciliolate. Strobiles very small and inconspicuous, apparently not often produced, 1–3 mm. long; sporophylls lax, 0.5–0.9 mm. long, sharply acuminate, keeled, the margins minutely denticulate.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On moist rocks, earth banks, or logs at chiefly middle elevations.

EXCLUDED RECORDS

Selaginella anomala (Hook. & Grev.) Spring, recorded from Guadeloupe by Fée, Mém. Fam. Foug. 11: 135. 1866, on the basis of a specimen collected by L'Herminier. This species is conspecific with *S. porelloides* (Lam.) Spring of Trinidad and Guyana. The Guadeloupe specimen was probably a misidentified plant of *S. tenella*.

Selaginella apus Spring was recorded from Martinique by Duss, Fl. Crypt. Antill. Franc. 125. 1904. This is a north-temperate species; the Martinique plant (*Duss 4132*) is probably *S. tenella*.

Selaginella flexuosa Spring was reported by Krug in Engl. Bot. Jahrb. 24: 150. 1897, from Martinique on the basis of *Duss 1600*. This name applies to a Brazilian species very different from any known from the Lesser Antilles; the correct identity of the plants seen by Krug remains in doubt.

Selaginella jungermannioides (Gaud.) Spring, a Brazilian species resembling *S. serpens*, was recorded from Martinique by Fée, Mém. Fam. Foug. 11: 134. 1866, on the basis of a specimen collected by Mlle. Rivoire. The record should probably be referred to *S. serpens*.

Selaginella martensii Spring, a Mexican species well known in cultivation, was recorded by Krug in Engl. Bot. Jahrb. 24: 151. 1897, and by Duss, Fl. Crypt. Antill. Franc. 127. 1904, from Guadeloupe on the basis of *Duss 3752*, and from Martinique on the basis of *Duss 3969*. These reports may have been based on misidentified material of *S. substipitata*.

Selaginella porelloides (Lam.) Spring was reported from Guadeloupe by Duss, Fl. Crypt. Antill. Franc. 126. 1904, on the basis of *Duss 3881*. This was probably a misidentification of *S. tenella*.

CLASS III. PTEROPSIDA

ORDER OPHIOGLOSSALES

Family OPHIOGLOSSACEAE

Terrestrial or epiphytic plants consisting of a short, fleshy rhizome bearing numerous more or less fleshy roots and one to several fronds (leaves). Fronds erect or pendent, not jointed, consisting of a basal stalk bearing at the apex a simple or variously subdivided sterile blade and (when fertile) an erect spore-bearing spike or panicle (sporophyll), or rarely the sporophylls several and not erect. Sporangia in 2 rows, naked, each opening by a transverse slit; spores all similar, yellowish. Gametophytes subterranean, very small, tuberlike, usually without chlorophyll, and bearing immersed antheridia.

A worldwide family of four genera and 60 or more species. One genus, represented by three species, occurs in the Lesser Antilles.

OPHIOGLOSSUM Linnaeus

Ophioglossum L., Sp. Pl. 2: 1062. 1753. FIGURE 4.

Perennial herbs, terrestrial or epiphytic. Rhizome short, usually erect, terminating in the erect exposed bud of the following season. Fronds erect or pendent, glabrous, somewhat fleshy, consisting of a common stalk (stipe), and a sterile and fertile portion. Sterile blade simple or palmately lobed, sessile or short-stalked, with reticulate venation. Sporophylls one or several simple, stalked spikes. Sporangia subglobose, more or less coalescent in 2 marginal rows.

TYPE SPECIES: *Ophioglossum vulgatum* L., of north-temperate regions.

A genus of about 45 species scattered almost throughout the world; three have been found in the Lesser Antilles.

SPECIAL LITERATURE: Maxon & Benedict in N. Am. Fl. **16**(1): 1–13. 1909; Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 373–375. 1926; Clausen, A monograph of the Ophioglossaceae, in Mem. Torrey Bot. Club **19**(2): 1–176, *figs. 1–33.* 1938.

KEY TO THE SPECIES

a. Sterile blade simple; sporophylls erect, solitary; plants terrestrial.
    b. Sterile blade cordate at base, to 9 cm. long; fruiting spike to 5.5 cm. long .... 1. *O. reticulatum*

b. Sterile blade obtuse or truncate at base, less than 3.5 cm. long; fruiting spike less than 2.5 cm. long .... 2. *O. harrisii*

a. Sterile blade palmately lobed; sporophylls not erect, often several; plants epiphytic .... 3. *O. palmatum*

1. **Ophioglossum reticulatum** L., Sp. Pl. 2: 1063. 1753; Griseb., Fl. Br. W. Ind. 649. 1864.

Lectotype: Plumier, Tr. Foug. *t. 164*, based on material from Fond de Baudin, near Léogane, Haiti.

Plants mostly 15–25 cm. tall, rarely more. Rhizomes 0.5–1(–2) cm. long, bearing persistent thick roots. Fronds solitary or occasionally 2, the basal stalk 5–10(–16) cm. long. Sterile blade deltate-ovate to reniform, 3–6(–10) cm. long, nearly sessile or petiolate to 10 mm., the apex rounded, obtuse or subacute, the vein areoles with few to numerous free or partly joined included veinlets. Fertile spikes with stalks 5–18 cm. long, the fertile portion 1–5.5 cm. long and bearing 20–60 pairs of sporangia. Sporangia 0.5–1 mm. in diameter; spores 30–40 μ. in diameter.

General Distribution: Pantropical.

Distribution in Lesser Antilles: Saba, Montserrat, Guadeloupe, Dominica, Martinique, Grenada.

Habitat: Clearings, moist banks, and grassy slopes under shrubs at chiefly low to middle elevations; plants sporadic and ephemeral in occurrence.

2. **Ophioglossum harrisii** L. M. Underw. in N. Am. Fl. 16(1): 11. 1909.

Type: *Underwood 169*, collected near Cinchona, Jamaica (NY).
Syn.: *Ophioglossum ekmanii* C. Chr. in Kongl. Sv. Vet. Akad. Handl. III, 16(2): 89. 1936.

Plants 4–18 cm. tall (usually less than 15 cm.), often reproducing vegetatively by stolonlike rootlets from which new individuals arise. Rhizomes short, subbulbous, erect. Fronds solitary or sometimes several, the basal stalk 1.5–9 cm. long. Sterile blade sessile, deltate or suborbicular, 1.5–3.5 cm. long, usually truncate or abruptly cuneate at base, the apex obtuse or rounded, the veins forming numerous small areoles (patterns similar to those of *O. reticulatum*). Fertile spikes with stalks 2.2–11.5 cm. long and with fertile portion 0.7–2.5 cm. long. Spores 35–40 μ. in diameter.

General Distribution: Jamaica, Hispaniola.

Distribution in Lesser Antilles: Grenada, *Sherring s.n.* (IJ).

Habitat: Grassy clay banks at middle to higher elevations; plants rare.

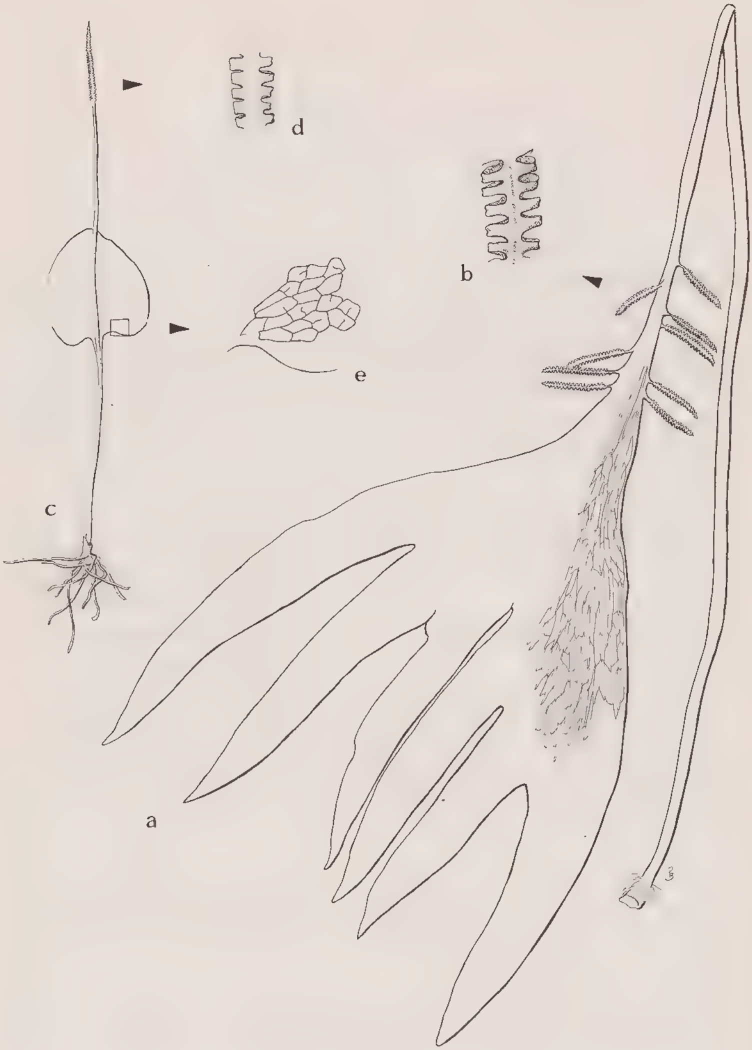

FIGURE 4. **Ophioglossum.** a, b, *O. palmatum*: a, habit, with partial venation, × 0.4; b, section of sporophyll, × 2.4. c–e, *O. reticulatum*: c, habit, × 0.4; d, section of sporophyll, × 2.4; e, enlarged portion of blade (inside box) showing venation, × 2.4.

This species is probably a mere ecological variant of *O. reticulatum*; its future acceptance will depend on further study.

3. **Ophioglossum palmatum** L., Sp. Pl. 2: 1063. 1753.

Lectotype: Plumier, Tr. Foug. *t. 163*, based on material originally found at Fond de Baudin, near Léogane, Haiti.

Syn.: *Cheiroglossa palmata* (L.) C. Presl, Suppl. Tent. Pter. 57. 1845.
Ophioderma palmata (L.) Nakai in Bot. Mag. Tokyo 39: 193. 1925.

Rhizome scaly, 1–2 cm. long, bearing numerous fleshy roots and usually several more or less arching-pendent fronds. Fronds up to 50 cm. long (rarely to 75 cm.), long-stalked. Sterile blades 4–30 cm. broad, palmately lobed, the lobes few and often unequal. Fertile fronds bearing several short-stalked fertile spikes along the margin of the stipe near base of sterile blade or rarely but a single fertile spike produced. Sporangia 0.6–1 mm. in diameter, in 8–60 fused pairs; spores 45–60 μ. in diameter.

General Distribution: Widespread in the American tropics from Florida and Mexico to Peru and Brazil; also found on islands of the Indian Ocean and in southeast Asia.

Distribution in Lesser Antilles: Montserrat, Guadeloupe.

Habitat: Usually growing from mossy trunks or humus-filled forks of large forest trees at middle elevations.

Order MARATTIALES

Family MARATTIACEAE

Terrestrial ferns with creeping or massive and erect rhizomes, these of a tough, fleshy texture. Fronds small to very large, articulate to the rhizome and accompanied at the point of attachment by stipulelike outgrowths. Blades simple or variously subdivided, sometimes the fertile and sterile blades dimorphic. Sporangia separate or more often coalescent to form thick synangia, opening by vertical pores or longitudinal slits; spores all similar. Gametophytes green, flat, with immersed antheridia.

Six genera are recognized, of which only one, *Danaea*, is known to occur in the Lesser Antilles. Two species of *Marattia* (*M. kaulfussii* and *M. laevis*, the latter synonymous with *M. alata*) have been attributed to "Dominica," but both records are now thought to pertain to the Dominican Republic in Hispaniola.

DANAEA Smith

Danaea Smith in Mém. Acad. Turin 5: 420. 1793. Figure 5.

Rhizomes oblique or horizontal, bearing thick, cordlike roots. Fronds (of Lesser Antillean species) once-pinnate, dimorphic. Sterile fronds erect or spreading, nodose-swollen at the insertion of the opposite pinnae, the

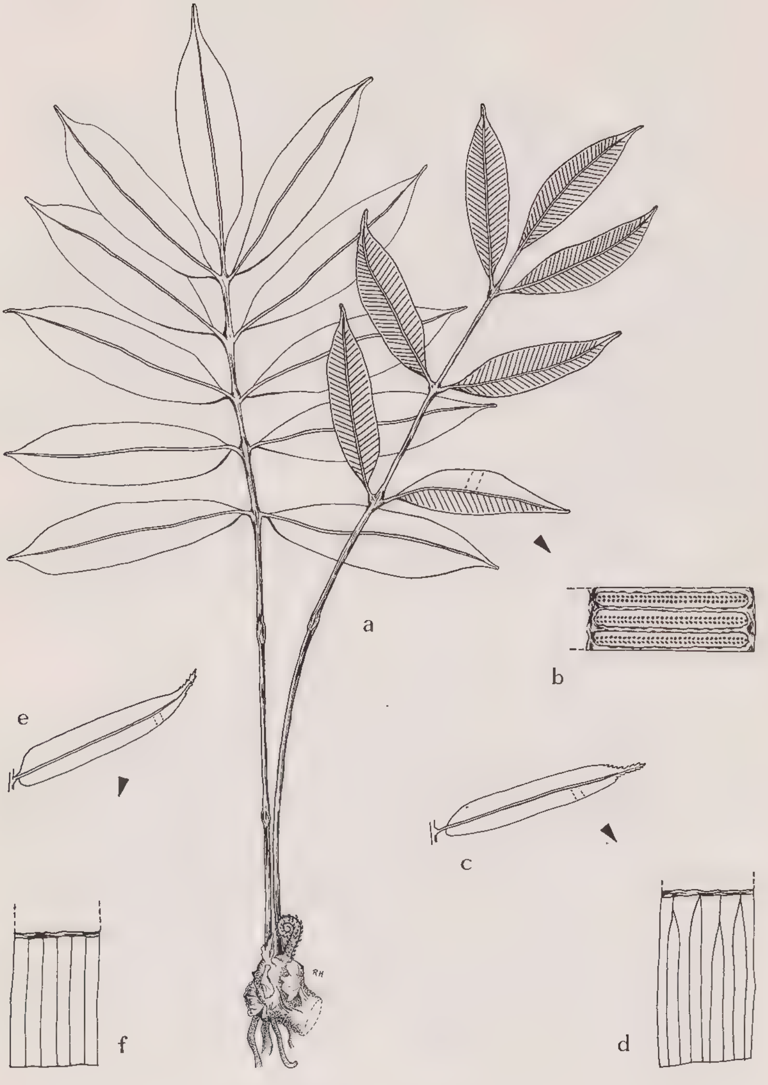

FIGURE 5. **Danaea.** a, b, *D. elliptica*: a, habit, × 0.5; b, enlarged portion of pinna (inside dashes) showing synangia, × 3.3. c, d, *D. stenophylla*: c, sterile pinna, × 0.5; d, enlarged portion of pinna (inside dashes) showing venation, × 3.3. e, f, *D. alata*: e, sterile pinna, × 0.5; f, enlarged area of pinna (inside dashes) showing venation, × 3.3.

lowermost nodes in some species lacking pinnae (in which case the stipe is described as being nodose), the veins all free, simple or forked. Fertile fronds usually somewhat longer and narrower than the sterile ones, with pinnae more or less contracted. Sporangia nearly covering the pinnae beneath (abaxial side), coalescent in double rows of plurilocular synangia, these opening by vertical pores.

TYPE SPECIES: *Danaea nodosa* (L.) Smith, based on *Acrostichum nodosum* L.

A genus of 35 or more species found only in the tropics of the Western Hemisphere.

SPECIAL LITERATURE: Underwood, American ferns — V. A review of the genus *Danaea*, in Bull. Torrey Bot. Club **29**: 669–679. 1902; Underwood & Benedict in N. Am. Fl. **16**(1): 17–23. 1909.

KEY TO THE SPECIES

a. Stipes without nodes; fronds to 2 m. long .... 1. *D. nodosa*
a. Stipes with 1–5 nodes; fronds less than 1 m. long.
  b. Sterile pinnae more than 2.5 cm. broad; pinnae in 2–6 pairs .... 2. *D. elliptica*
  b. Sterile pinnae less than 2.5 cm. broad; pinnae in 10–30 pairs.
    c. Veins mostly simple, 6–12 per cm. .... 3. *D. alata*
    c. Veins mostly forking, 12–15 per cm. .... 4. *D. stenophylla*

1. **Danaea nodosa** (L.) Smith in Mém. Acad. Turin **5**: 420. 1793.

Basionym: *Acrostichum nodosum* L., Sp. Pl. **2**: 1070. 1753.
Lectotype: Plumier, Tr. Foug. *t. 108*, based on material collected either in Martinique or Haiti.
Syn.: *Asplenium nodosum* (L.) L., Sp. Pl. ed. 2, **2**: 1539. 1762.
Danaea longifolia Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 307. 1811. (Type found "in Antillis.")

Rhizome short-creeping. Fronds erect-arching; stipes nodeless, very stout, sulcate, minutely scaly. Sterile blades broadly oblong, often 1 m. long, up to 70 cm. broad; pinnae 7–15 pairs and a terminal one, 3–5 cm. broad, subfalcate, abruptly long-acuminate, slightly serrulate at the tip but otherwise entire, with midvein sparsely scaly beneath, and veinlets forked at base. Fertile blades with shorter and narrower pinnae, usually 1.5–2.5 cm. broad.

GENERAL DISTRIBUTION: Greater Antilles, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

HABITAT: Wet forest glades at middle to higher elevations.

2. **Danaea elliptica** Smith in Rees, Cycl. 11: *Danaea No. 2*. 1808.

Lectotype: *Sloane Herb.* vol. 1, p. 85, collected on Mt. Diablo, Jamaica (BM).
Syn.: *Danaea polymorpha* Leprieur ex Baker in Ann. Bot. 5: 499. 1891. (Syntypes from Guadeloupe, *Mazé*, and Grenada, *Sherring*.)
Danaea oligosora Fourn. ex Christ in Hedwigia 44: 369. 1905. (Type: *Duss 7*, from Guadeloupe.)

Rhizome stout, oblique, densely beset with stipe bases and papery stipules. Fronds 40–90 cm. long, very dark green; stipes deep olive-brown, with 1–4 nodes, bearing numerous small brown scales. Sterile blades broadly oblong to subovate, 20–35 cm. long, 15–30 cm. broad; pinnae 2–6 pairs and a similar terminal one, oblanceolate-oblong to narrowly elliptic, acuminate, entire throughout, with veinlets once-forked at or near the base. Fertile fronds slightly shorter and narrower than the sterile fronds, with narrower pinnae.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Wet, shaded ravines at middle elevations.

3. **Danaea alata** Smith in Mém. Acad. Turin 5: 420. 1793.

Lectotype: Plumier, Tr. Foug. *t. 109*, based on a plant collected at Morne de la Calebasse, Martinique.
Syn.: *Danaea fendleri* L. M. Underw. in Bull. Torrey Bot. Club 29: 673. 1902. (Type from Trinidad.)

Rhizome short-creeping or oblique, subwoody. Fronds close, erect; stipes 20–50 cm. long, olive-brown or purplish, minutely scaly, with 1–3 enlarged nodes. Sterile blades 25–45 cm. long, mostly 15–20 cm. broad; rhachis sparsely scaly and narrowly and discontinuously winged (juvenile plants with rhachis broadly winged); pinnae 10–25 pairs, these 1.7–2.5 cm. broad, unequally cuneate to cordate at base, acuminate-serrulate at apex, the midveins minutely scaly beneath. Fertile fronds slightly longer and narrower than the sterile fronds, with much narrower pinnae 6–9 cm. long.

GENERAL DISTRIBUTION: Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Wet, shaded ravines at middle to higher elevations; plants uncommon.

4. **Danaea stenophylla** Kunze, Farrnkr. 1: 55, *t. 28*. 1840.

Type: *L'Herminier 213*, collected in Guadeloupe (K, isotype).
Syn.: *Danaea mazeana* L. M. Underw. in Bull. Torrey Bot. Club 29: 676. 1902. (Type from Guadeloupe.)

Rhizome short-creeping to suberect, sometimes rather elongate. Fronds to 1 m. long; stipes 20–50 cm. long, olive- or reddish-brown, minutely scaly, with 2–4 enlarged nodes. Sterile blades 25–50 cm. long, 18–25 cm. broad; rhachis scaly and very narrowly winged; pinnae 12–30 pairs, 1–2 cm. broad, unequally cuneate at base, usually abruptly cuspidate-acuminate and coarsely serrulate at apex. Fertile fronds longer and narrower, with much narrower pinnae 7–12 cm. long.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Moist rain forests at middle elevations; plants rare.

Order FILICALES

Family SCHIZAEACEAE

Terrestrial (rarely epiphytic) ferns of widely diverse habit and form. Sporangia mostly obovoid or pyriform, with subapical annulus contracted below, opening by a longitudinal fissure, borne singly or in rows, usually on more or less specialized lobes or segments (sporangiophores), or on slender ultimate divisions of special nonleafy pinnae; indusium present or absent. Gametophytes variable, usually flat and simple or, in *Schizaea*, branched-filamentous.

Some recent authors have separated this taxon into three families corresponding to the three genera listed below. In the present context such a procedure seems to serve no useful purpose, although it must be recognized that the three groups are probably much less closely related than the similarity of their sporangial structure would seem to suggest.

Special literature: Maxon in N. Am. Fl. **16**(1): 31–52. 1909; Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 380–382. 1926.

Key to the Genera

a. Fronds vinelike, twining, of indefinite growth; sporangia borne on contracted marginal lobes of green, leafy pinnules .... 1. *Lygodium*
a. Fronds not vinelike.
    b. Blades pinnately compound, with a pair of nonleafy fertile basal pinnae .... 2. *Anemia*
    b. Blades simple and linear, or dichotomously divided toward apex; sporangiophores apical .... 3. *Schizaea*

LYGODIUM Swartz

Lygodium Sw. in J. Bot. Schrader **1800**(2): 106. 1801, nom. cons.

Figure 6.

Ferns with twining, vinelike fronds of indefinite growth, these borne dorsally in a single row on a slender, branched, hairy underground rhi-

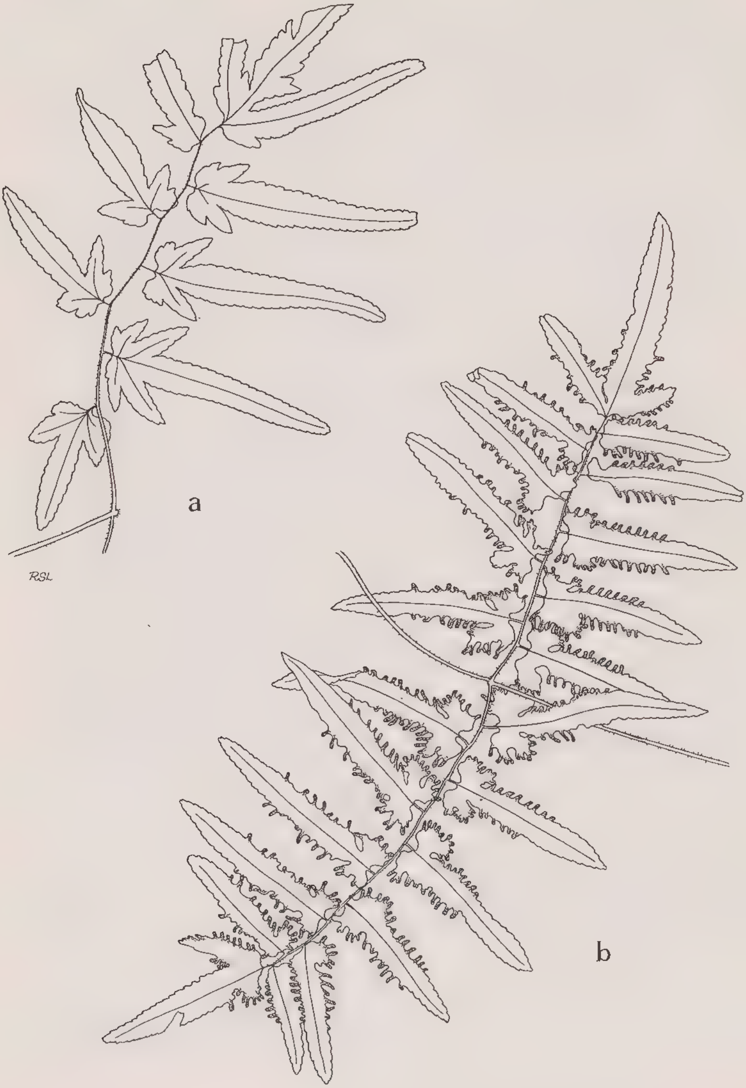

FIGURE 6. **Lygodium.** a, b, *L. venustum*, habit, × 0.5.

zome. Blade consisting of short alternate primary pinnae (each reduced to a mere stalk), bearing at the apex a pair of opposite secondary pinnae with an included (apical) usually abortive bud, the secondary pinnae subpalmately lobed, pinnate, or pinnately compound, the tertiary divisions alternate. Sporangia loosely arranged in a row on each side of the midvein of contracted marginal segments (sporangiophores), each protected by a hood-shaped indusium opening antrorsely; spores tetrahedral. Gametophytes green, flat.

Type species: *Lygodium scandens* (L.) Sw., based on *Ophioglossum scandens* of the African, Asiatic, and Australian tropics.

About 39 species of Lygodium are known; of these, only one has been found in the Lesser Antilles.

1. **Lygodium venustum** Sw. in J. Bot. Schrader **1801**(2): 303. 1803; Griseb., Fl. Br. W. Ind. 651. 1864.

Type: *Breynius s.n.*, from Brazil (? s).

Rhizome short, densely clothed at apex with glossy, dark brown, articulate hairs up to 5 mm. long; stipe and other vascular parts densely pubescent with pale brown to whitish articulate hairs, these progressively smaller toward apex of the frond. Tertiary divisions stalked (except the apical ones), 4–10 cm. long, the costule nodose at top of stalk, the blade cordate, palmately veined, lobed at base, with an elongate, pinnately veined middle lobe, this 1–1.8 cm. broad, obtuse at apex, the margin crenate-serrate and serrulate, or sometimes lobed and denticulate-serrate, with veins branched, prominulous. Sporangiophores pubescent, up to 8 mm. long.

General Distribution: Greater Antilles except Puerto Rico; Tobago, Trinidad, continental tropical America from Mexico to Peru and Brazil.

Distribution in Lesser Antilles: Guadeloupe, La Trinité, *Germain ex Herb. L'Herminier* (p); Grenada.

Habitat: Moist banks and roadside thickets.

This species was recorded by Domin (Pter. Dominica 41. 1929) from Grenada under the name *L. polymorphum*, a name sometimes mistakenly applied to this species.

ANEMIA Swartz

Anemia Sw., Syn. Fil. 6, 155. 1806, nom. cons. Figure 7.

Rhizome creeping or ascending, usually short, clothed with articulate (pluricellular) hairs. Fronds pinnatifid to pinnately compound, completely dimorphic or with a basal pair of fertile pinnae on otherwise similar fronds; veins free or reticulate. Sporangia borne in a row on either side of narrow ultimate divisions.

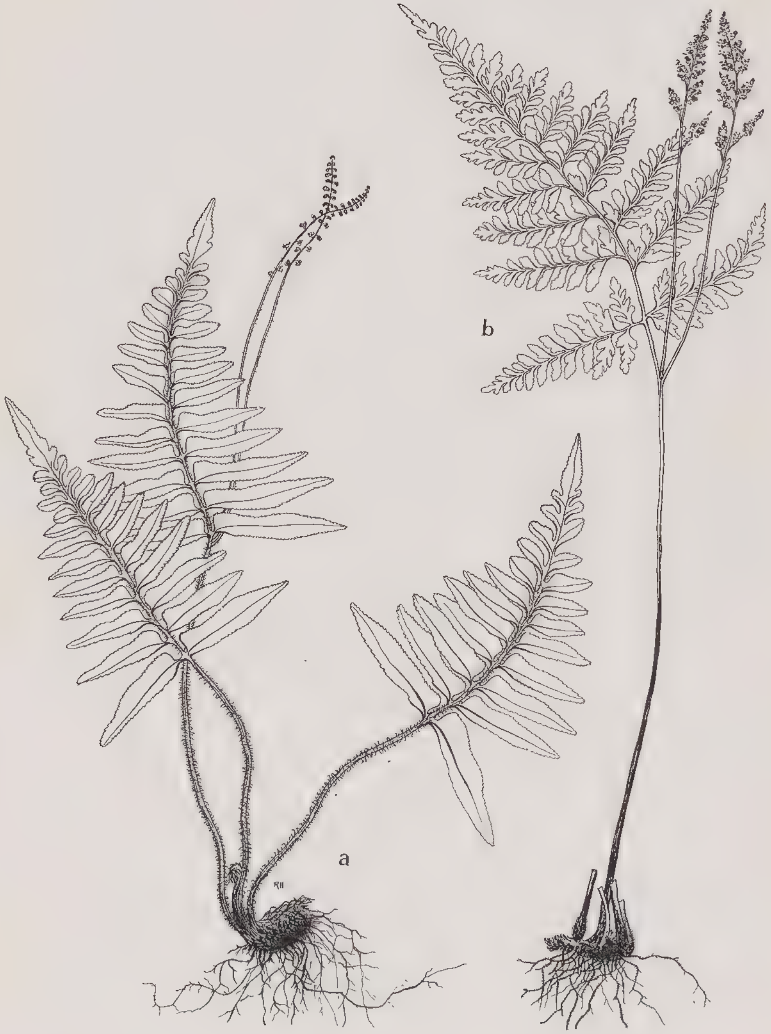

FIGURE 7. **Anemia.** a, *A. hirta*, habit, × 0.5. b, *A. adiantifolia*, habit, × 0.5.

TYPE SPECIES: *Anemia phyllitidis* (L.) Sw., based on *Osmunda phyllitidis* L. of the Greater Antilles and continental tropical America.

A pantropical genus of about 90 species; two found in the Lesser Antilles.

KEY TO THE SPECIES

a. Sterile blades 1-pinnate; fertile pinnae nonindusiate .... 1. *A. hirta*
a. Sterile blades 2–3-pinnate; fertile pinnae indusiate ...... 2. *A. adiantifolia*

1. **Anemia hirta** (L.) Sw., Syn. Fil. 155. 1806.

Basionym: *Osmunda hirta* L., Sp. Pl. 2: 1064. 1753.
Lectotype: Plumier, Descr. Pl. Amer. *t. 26* (= Tr. Foug. *t. 157*), based on a plant from Martinique.

Rhizome ascending. Fronds densely clustered, the fertile fronds 20–35 cm. long, with stipe and rhachis densely rusty-villous. Sterile blade ovate-deltate, acuminate, 7–15 cm. long and 6–11 cm. broad; pinnae in 6–13 pairs, strongly inequilateral at base and with serrulate-crenulate margins, the veins forked, free, these and the tissue sparsely hirsutulous on both sides. Fertile pinnae 8–17 cm. long, exceeding the sterile blade.

GENERAL DISTRIBUTION: Hispaniola, Puerto Rico, South America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Guadeloupe, Martinique.

HABITAT: Shady banks at lower elevations.

2. **Anemia adiantifolia** (L.) Sw., Syn. Fil. 157. 1806; Griseb., Fl. Br. W. Ind. 650. 1864.

Basionym: *Osmunda adiantifolia* L., Sp. Pl. 2: 1065. 1753.
Lectotype: Plumier, Tr. Foug. *t. 158*, based on material from near Petit Goave, Haiti.
Syn.: *Ornithopteris adiantifolia* (L.) Bernh. in Neues J. Bot. Schrader 1(2): 50. 1806.

Rhizome creeping, branched. Fronds distichous, the sterile fronds arching or ascending, 15–70 cm. long, the fertile fronds averaging slightly longer and more erect, all with strongly pubescent rhachis, otherwise sparingly hispidulous on both sides. Sterile blades ovate-deltate or subpentagonal, 5–35 cm. long, 4–28 cm. broad at base; pinnae stalked and inequilateral; ultimate segments mostly oblong-obovate, obtuse, of coriaceous texture, the margins erose-denticulate and thickened, the venation flabellate. Fertile pinnae usually shorter than to slightly exceeding the sterile portion of the frond.

GENERAL DISTRIBUTION: Florida, Greater Antilles, Trinidad, Mexico, Guatemala, northern South America.

Distribution in Lesser Antilles: Antigua, St. Kitts, Montserrat, Guadeloupe, La Desirade, Marie Galante, Les Saintes, Dominica, Martinique, Barbados.

Habitat: Shaded, chiefly calcareous banks and ledges at low to medium elevations.

SCHIZAEA Smith

Schizaea Smith in Mém. Acad. Turin **5**: 419. 1793, nom. cons.

Figure 8.

Plants growing in sterile soil or decaying wood. Rhizome short, creeping or ascending, bearing numerous pluricellular hairs. Fronds crowded, simple to repeatedly dichotomous; venation simple to repeatedly dichotomous; fertile segments (sporangiophores) in small pinnate or pseudodigitate clusters, located at apex of simple fronds or at the ends of segments of dichotomous ones. Sporangia borne in rows on each side of the midrib of a sporangiophore; nonindusiate; spores bilateral. Gametophytes filamentous.

Type species: *Schizaea dichotoma* (L.) Smith, based on *Acrostichum dichotomum* L. of southeastern Asia, Polynesia, and Australia.

A genus of 30 or more species; three have been found in the Lesser Antilles, all apparently very rare.

Key to the Species

a. Fronds simple, linear; sporangiophores in a pseudodigitate cluster.
  b. Fronds 5–15(–20) cm. long, less than 1 mm. in width; sporangiophores 3–5(–8), mostly 8–15 mm. long .... 1. *S. germanii*
  b. Fronds 25–55 cm. long (rarely less when mature), 1–2 mm. in width; sporangiophores 6–14, mostly 20–45 mm. long .... 2. *S. pennula*
a. Fronds dichotomously branched; sporangiophores in a small, dense, pinnate spike .... 3. *S. fluminensis*

A fourth species, *Schizaea elegans* Vahl, may eventually be discovered in the Lesser Antilles. It is related to *S. fluminensis*, but can be distinguished from that species by its much larger size, with sterile segments 1–3 cm. broad; those of *S. fluminensis* are seldom more than 0.3 cm. broad.

1. **Schizaea germanii** (Fée) Prantl, Schiz. 132. 1881.

Basionym: *Actinostachys germanii* Fée, Mém. Fam. Foug. **11**: 123, *t. 29, fig. 3.* 1866.

Type: *Germain s.n.*, from Guadeloupe. The localities Sainte-Rose, Petit Bourg, and Deshaies were all cited by Fée with the original description, indicating that he had at least three collections at hand when describing this species. The present writer has seen no authentic specimen that could be designated a lectotype. If such a specimen cannot be located, Fée's figure (cited above) can serve as lectotype.

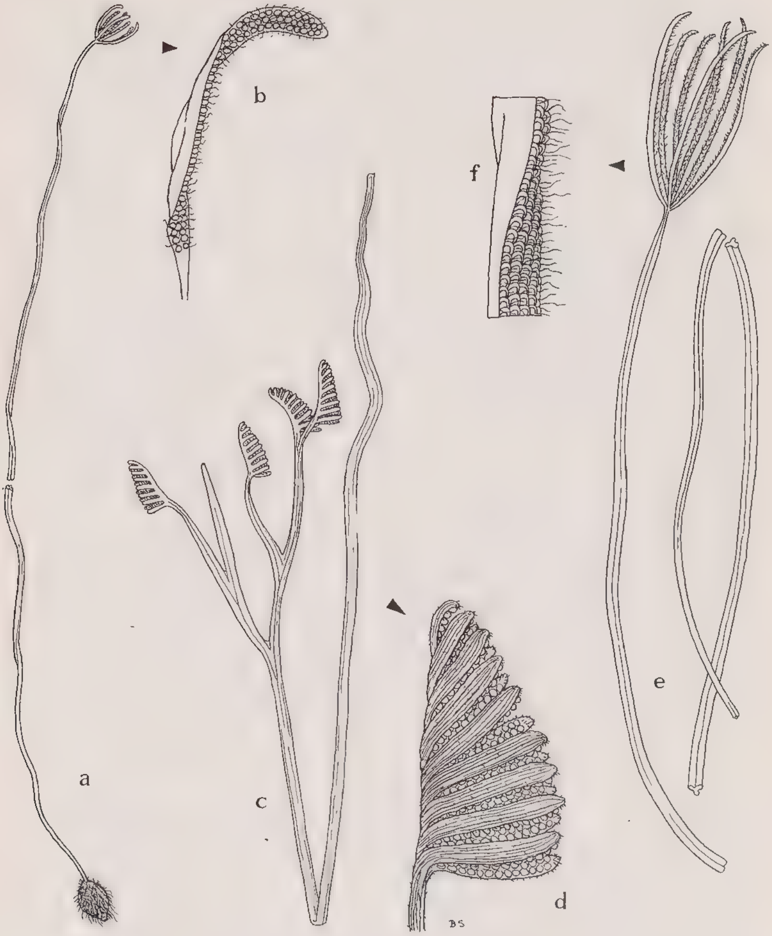

FIGURE 8. **Schizaea.** a, b, *S. germanii*: a, section of frond, × 0.8; b, sporangiophore, × 6.0. c, d, *S. fluminensis*: c, section of frond, × 0.4; d, sporangiophores arranged in pinnate spike, × 4.0. e, f, *S. pennula*: e, sections of frond, showing strongly 3-angled base, × 0.4; f, section of sporangiophore, × 3.4.

Rhizome a small, round, hairy tuber less than 1 cm. in diameter, buried in humus or decaying wood, the fronds growing either directly from this tuber or else from the ends of long slender offshoots (stolons ?) 1–3 cm. long. Fronds 1-several, all strongly costate, glabrous except for the midrib of the sporangiophores. Sporangiophores with margins more or less reflexed. Sporangia in 2 rows; spores delicately maculate.

General Distribution: Florida, Cuba, Belize.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Shaded pockets of humus or rotten wood at low elevations.

2. **Schizaea pennula** Sw., Syn. Fil. 150, 379. 1806; Griseb., Fl. Br. W. Ind. 651. 1864.

Type: Swartz cited no locality or collector with his description.
Syn.: *Acrostichum pennula* (Sw.) Poiret in Lam., Encycl. Méth. Bot. Suppl. 1: 125. 1810.
Actinostachys pennula (Sw.) Hook., Gen. Fil. *t. 111–A.* 1842.

Rhizome a small ascending tuber, the fronds clustered from the apex. Fronds strongly 3-angled at base, flattish and strongly costate above, glabrous except for the sporangiophores. Sporangia mostly in 4 rows; spores delicately maculate.

General Distribution: Puerto Rico, Trinidad, continental tropical America from Costa Rica to Uruguay.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Not known for plants collected in Guadeloupe; in South America, where this species is fairly common, it most often grows on sandy savannas or among dry rock outcrops at low to medium elevations.

3. **Schizaea fluminensis** Miers ex Sturm in Mart., Fl. Bras. 1(2): 184, *t. 15, fig. 2.* 1859.

Type: *Spruce s.n., Oct. 1852*, collected in Brazil, "prope Panure ad Rio Uaupes" (GH, isotype).
Syn.: *Lophidium fluminense* (Miers ex Strum) L. M. Underw. ex Maxon in N. Am. Fl. **16**(1): 38. 1909.

Rhizome short-creeping or ascending, rusty-hairy, bearing 1–3 erect fronds. Fronds 4–30 cm. long; stipes 3–24 cm. long, sparingly pilose, the lower part usually buried in humus. Blade 2–7.5 cm. long, 2–3-times dichotomous (rarely simple), the segments 1–3 mm. broad, mostly unicostate. Fertile spikes 6–15 mm. long, incurved, conduplicate, bearing 7–14 pairs of slender, pilose sporangiophores. Spores delicately verrucose.

General Distribution: Jamaica, South America.

Distribution in Lesser Antilles: Grenada.

Habitat: "Grows in dense shade at foot of large trees" (ex W. E. Broadway).

Family GLEICHENIACEAE

Terrestrial ferns with slender, long-creeping, forked rhizomes. Fronds pinnate or variously compound, usually pseudodichotomous by abortion of successive terminal buds, often scrambling in habit and forming dense thickets, the veins free, forked. Sporangia in small dorsal clusters (sori), subsessile, each with a complete transverse median annulus, opening by a longitudinal slit. Gametophytes green, flat, costate, the margins ruffled-wavy.

A family of at least 130 known species, classified in up to six genera, occurring chiefly in tropical regions. Six species are recorded from the Lesser Antilles, here placed in two genera.

SPECIAL LITERATURE: Underwood, American ferns — VIII. A preliminary review of the North American Gleicheniaceae, in Bull. Torrey Bot. Club **34**: 243–262. 1907; Maxon in N. Am. Fl. **16**(1): 53–63. 1909; Holttum, Florae Malesianae Prescursores XVI. On the taxonomic subdivision of the Gleicheniaceae with descriptions of new Malaysian species and varieties, in Reinwardtia **4**(2): 257–280. 1957.

KEY TO THE GENERA

a. Rhizome and fronds wholly lacking scales (branched hairs present at least on the rhizome); sori of 8–15 or more sporangia, lacking paraphyses; lateral veins in lobes of lamina forked 2–4 times .... 1. *Dicranopteris*

a. Rhizome bearing scales, the fronds with scales at least on buds at the forks; sori of 2–4 sporangia, these accompanied by paraphyses; lateral veins in lobes of lamina not more than once-forked .... 2. *Gleichenia*

DICRANOPTERIS Bernhardi

Dicranopteris Bernh. in Neues J. Bot. Schrader 1(2): 38. 1806.
FIGURE 9.

Essential generic description as indicated in the key.

TYPE SPECIES: *Polypodium dichotomum* Thunb. from eastern Asia, now correctly known as *Dicranopteris linearis* (Burm.) L. M. Underw.

A small genus of perhaps a dozen species, some of them extremely variable. Two species occur in the Lesser Antilles.

KEY TO THE SPECIES

a. Frond forks each bearing a pair of reflexed, pinnatifid accessory pinnae .... 1. *D. flexuosa*

a. Frond forks without accessory pinnae .... 2. *D. pectinata*

1. **Dicranopteris flexuosa** (Schrader) L. M. Underw. in Bull. Torrey Bot. Club **34**: 234. 1907.

Basionym: *Mertensia flexuosa* Schrader in Goett. Gel. Anz. **1824**: 863. 1824. Type: *Maximilian Prinz Neuwied s.n.*, from Brazil (LE).

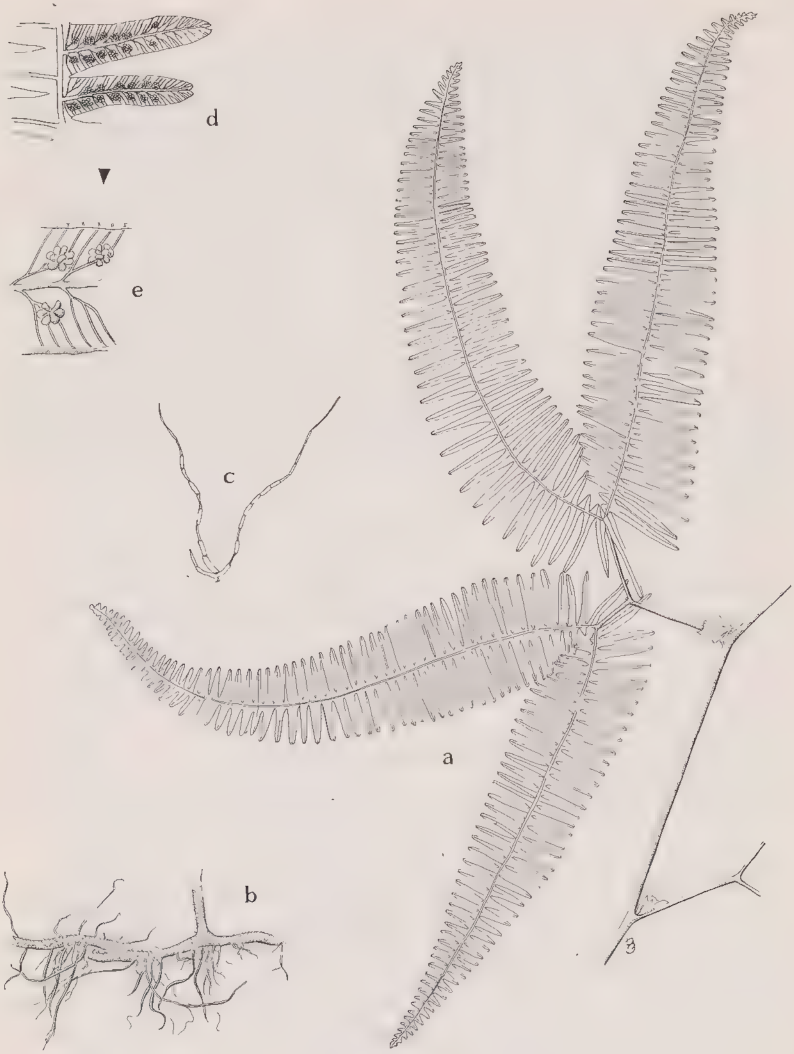

FIGURE 9. **Dicranopteris.** a–e, *D. pectinata*: a, section of frond, × 0.4; b, rhizome, × 0.4; c, articulate rhizome hair, × 12.0; d, section of fertile pinna, × 2.0; e, enlarged portion of fertile pinna, showing venation and position of sori, × 6.0.

Syn.: *Gleichenia flexuosa* (Schrader) Mettenius in Ann. Mus. Bot. Ludg.-Bat. **1**: 50. 1863.
Mertensia dichotoma sensu Griseb., Fl. Br. W. Ind. 652. 1864, not Willd. in L., 1810.
Mertensia dichotoma var. *β l'herminieri* Fée, Mém. Fam. Foug. **11**: 121. 1866. (Type from Guadeloupe.)
Dicranopteris linearis var. *l'herminieri* (Fée) Nakai in Bull. Nat. Sci. Mus. Tokyo **29**: 66. 1950.

Rhizome 2–5 mm. in diameter, brown, clothed toward apex with numerous spreading, castaneous, articulate hairs. Primary frond axis 2–4 mm. in diameter; primary lateral branches consisting of several opposite, distant pairs, these repeatedly pseudodichotomous, lacking a secondary axis; primary internodes usually 6–8(–18) cm. long, others shorter, the nodes stipulate above and with accessory pinnae below. Accessory pinnae reaching as much as 13 cm. in length, but those of the upper nodes much smaller; pinnae sessile, 12–23 cm. long, 2–6 cm. broad, with outer basal segment often prolonged and deeply pinnatifid, cut nearly to the rhachis, glabrous throughout, light- or yellowish-green above, glaucous beneath, the margins strongly revolute.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Guadeloupe, Martinique; very rare.

HABITAT: Moist montane thickets.

2. **Dicranopteris pectinata** (Willd.) L. M. Underw. in Bull. Torrey Bot. Club **34**: 260. 1907.

Basionym: *Mertensia pectinata* Willd. in Kongl. Sv. Vet. Akad. Handl. II, **25**: 168. 1804; Griseb., Fl. Br. W. Ind. 652. 1864.
Type: *Bredemeyer, Herb. Willd. 19465*, from near Caracas, Venezuela (B).

Rhizome 3–5 mm. in diameter, light brown, scabrous, clothed with numerous deciduous, castaneous, articulate hairs. Primary frond axis 3–6 mm. in diameter; primary lateral branches consisting of several opposite pairs, stipulate in the forks, repeatedly and unequally forking, producing a naked flexuous secondary axis, the shorter branches once- or twice-forked; primary internodes 2–16 cm. long or more, the others shorter. Pinnae variable, 10–25 cm. long, 1.5–6 cm. broad, very glaucous and glabrous beneath or sometimes sparsely stellate-pubescent, the segments usually notched at the apex, with veins 3–5-forked. Sori numerous or sometimes entirely lacking.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America; common and widely distributed.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Thickets and clearings at chiefly middle elevations, often forming dense tangles.

GLEICHENIA Smith

Gleichenia Smith in Mém. Acad. Turin **5**: 419, *t. 9, fig. 10*. 1793, nom. cons. FIGURE 10.

Essential generic description as indicated in the key.

TYPE SPECIES: *Gleichenia polypodioides* (L.) Smith, based on *Onoclea polypodioides* L. of South Africa.

A pantropical genus of more than 100 species, of which four have been found in the Lesser Antilles.

KEY TO THE SPECIES

a. Primary branches bipinnate, the rhachis not forked ...... 1. *G. bancroftii*
a. Primary branches 1- to several-times forked, the divisions 1-pinnate or pinnatisect.
  b. Primary internodes less than 2 cm. long; under surface of the lamina beset with numerous minute erect clavate glands ...... 2. *G. farinosa*
  b. Primary internodes usually 3 cm. long or more; lamina without erect clavate glands beneath.
    c. Ultimate rhachises densely scaly, the scales whitish or pale yellowish-brown with ciliate margins; tissue beneath minutely whitish-granulose, and bearing scattered whitish scales but not woolly-tomentose .... 3. *G. furcata*
    c. Ultimate rhachises lightly scaly, the scales brown and densely woolly-fibrillose; tissue not whitish-granulose beneath, usually concealed by woolly tomentum .... 4. *G. bifida*

1. **Gleichenia bancroftii** Hook., Sp. Fil. **1**: 5, *t. 4-A*. 1844.

Type: *Dr. Bancroft*, from Jamaica (K).

Syn.: *Mertensia bancroftii* (Hook.) Kunze in Linnaea **18**: 307. 1844; Griseb., Fl. Br. W. Ind. 651. 1864.
Mertensia grandis Fée, Mém. Fam. Foug. **11**: 120. 1866. (Type: *L'Herminier*, from Guadeloupe.)
Mertensia trisperma Fée, ined. (?) (Specimens of *L'Herminier 221*, coll. 1862, so named are at GH, K.)
Gleichenia longissima sensu Duss, Foug. & Lyc. Antill. Franc. 107. 1903, not Blume, 1828.
Dicranopteris bancroftii (Hook.) L. M. Underw. in Bull. Torrey Bot. Club **34**: 252. 1907.
Hicriopteris bancroftii (Hook.) Ching in Sunyatsenia **5**: 278. 1940.
Dicranopteris grandis (Fée) Nakai in Bull. Nat. Sci. Mus. Tokyo **29**: 60. 1950.

Rhizome up to 6 mm. in diameter, muriculate, bearing numerous light brown, lanceolate, long-acuminate, mostly glabrous scales up to 7 mm. long. Primary frond axis about 5 mm. in diameter, slightly scaly toward

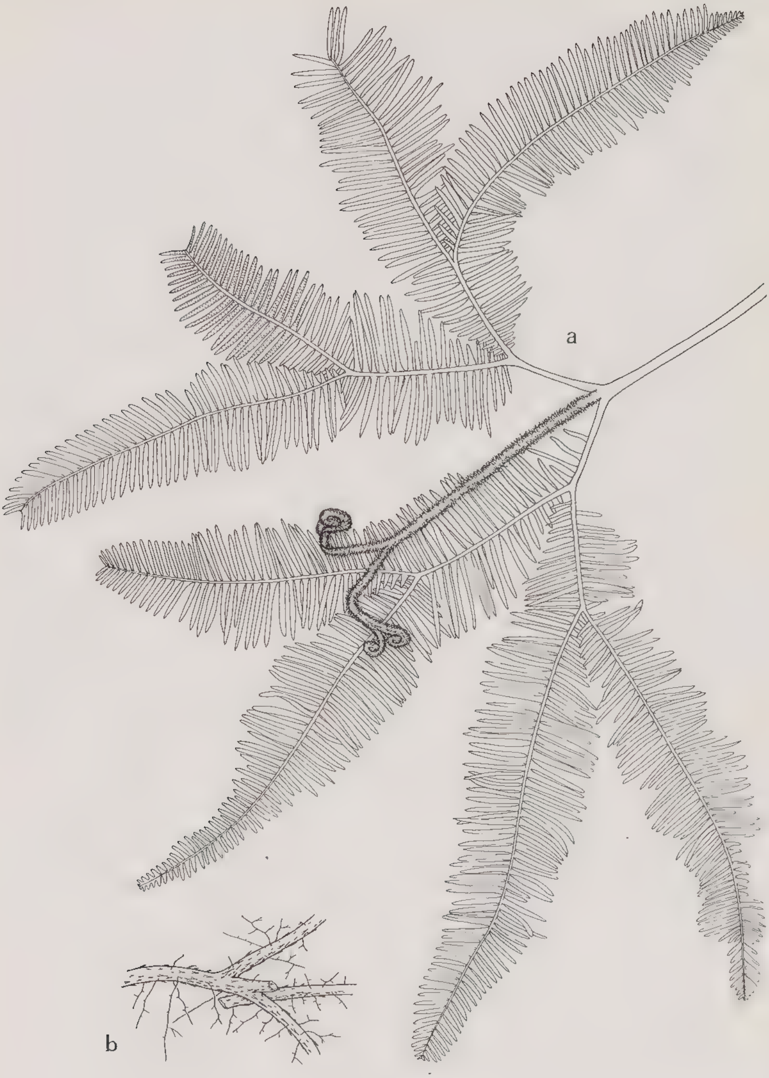

Figure 10. **Gleichenia.** a, b, *G. furcata*: a, frond and densely scaly ultimate rhachis, × 0.4; b, rhizome, × 0.4.

base, bearing a pair of large bipinnate pinnae; axial growth sometimes continued from the included bud, producing up to several more pairs of pinnae. Pinnae determinate, oblong, 1–1.5 m. long, 30–50 cm. broad, the pinnules very numerous, sessile, 3–4.5 cm. broad, cut to the costa into numerous linear, brittle segments about 2.5 mm. broad; tissue light- or yellowish-green above, glaucous beneath, nearly glabrous, with veins once-forked near the base. Terminal bud large, up to 2 cm. long, densely clothed with whitish to dull yellowish long-acuminate scales.

GENERAL DISTRIBUTION: Jamaica, continental tropical America from Mexico to Bolivia.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: Montane thickets.

2. **Gleichenia farinosa** (Kaulf.) Hook., Sp. Fil. **1**: 9. 1844, in part.

Basionym: *Mertensia farinosa* Kaulf., Wes. Farrenkr. 37. 1827; Griseb., Fl. Br. W. Ind. 652. 1864, in part, with regard to ref. Dominica.

Type: Neither collector nor locality were cited with the original description. Hooker attributed the species to Trinidad on the basis of a specimen distributed by Sieber, but in view of present information, this locality must have been an error.

Syn.: *Mertensia subtrisperma* Fée, Mém. Fam. Foug. **11**: 122, *t. 32, fig. 2.* 1866. (Type from Guadeloupe.)
Gleichenia subtrisperma (Fée) Krug in Engl. Bot. Jahrb. **24**: 78. 1897.
Dicranopteris farinosa (Hook.) L. M. Underw. in Bull. Torrey Bot. Club **34**: 254. 1907.
Diplopterygium farinosum (Hook.) Nakai in Bull. Nat. Sci. Mus. Tokyo **29**: 50. 1950, in part.

A small erect plant 15–35 cm. tall, often deeply embedded in moss. Rhizome 2–3 mm. in diameter, dark purple-brown, sparsely clothed with light brown, lance-attenuate, short-ciliate scales. Primary frond axis 1–2 mm. in diameter, clothed with a few yellowish-brown ciliate scales, and producing 1–3 pairs of mostly once-forked branches; primary internodes pinnatifid-leafy on adaxial side only. Pinnae 7–14 cm. long, 1.5–3.5 cm. broad, incised nearly to the rhachis; rhachis and costae beneath bearing numerous narrow, yellowish-brown, strongly ciliate scales, the veins once-forked, concealed.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Martinique.

HABITAT: Confined to exposed mossy summits of volcanic mountains.

3. **Gleichenia furcata** (L.) Sprengel in L., Syst. Veg. **4**: 25. 1827.

Basionym: *Acrostichum furcatum* L., Syst. Nat. ed. 10, **2**: 1321. 1759.

Lectotype: Plumier, Descr. Pl. Amer. *t. 20,* based on a plant from Morne de la Calebasse, Martinique.

Syn.: *Pteris dichotoma* L., Sp. Pl. 2: 1076. 1753, in part, not *Gleichenia dichotoma* (Thunb.) Hook., 1844.
Mertensia furcata (L.) Willd. in Kongl. Sv. Vet. Akad. Handl. II, 25: 166. 1804; Griseb., Fl. Br. W. Ind. 651. 1864, in part, with regard to ref. "French Islands."
Dicranopteris furcata (L.) L. M. Underw. in Bull. Torrey Bot. Club 34: 257. 1907.

Rhizome woody, to 6 mm. in diameter, clothed with glossy brown, attenuate scales, these minutely ciliate especially toward the apex. Primary frond axis 5–6 mm. in diameter, clothed with numerous pale chaffy scales (as are the undersides of the rhachises); primary branches 2–3 pairs, these 1- to 4-forked, the branches continuously pectinate above the primary internodes. Ultimate pinnae to 15 cm. long or more (but usually less), mostly 3–6 cm. broad, with segments linear, ca. 3 mm. broad, somewhat woolly beneath with long-ciliate, hairlike scales, the veins mostly once-forked.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Vincent.

HABITAT: Mostly in rather exposed situations at higher elevations, frequently a principal constituent of montane thickets.

4. **Gleichenia bifida** (Willd.) Sprengel in L., Syst. Veg. 4: 24. 1827.

Basionym: *Mertensia bifida* Willd. in Kongl. Sv. Vet. Akad. Handl. II, 25: 168. 1804.
Type: *Bredemeyer, Herb. Willd. 19468*, collected near Caracas, Venezuela (B).
Syn.: *Mertensia fulva* Desvaux in Mém. Soc. Linn. Paris 6: 201. 1827. (Type from Jamaica.)
Mertensia longipinnata Klotzsch in Linnaea 18: 537. 1844; Griseb., Fl. Br. W. Ind. 652. 1864.
Dicranopteris fulva (Desvaux) L. M. Underw. in Bull. Torrey Bot. Club 34: 253. 1907.
Sticherus bifidus (Willd.) Ching in Sunyatsenia 5: 282. 1940.

Rhizome 3–4 mm. in diameter, reddish-brown, bearing narrow, attenuate, short-ciliate scales especially near the apex. Primary frond axis 1.5–4 mm. in diameter, with a few pale brown, ciliate, deciduous scales, these also occurring abundantly on all the main vascular parts of the lamina beneath; primary lateral branches two to several pairs, each branch 1- to 2-forked, a secondary axis seldom developed. Pinnae 25–50 cm. long, 3–7 cm. broad, often arcuate, the segments linear from a dilatate base, densely woolly beneath with rusty brown tomentum, the veins once-forked at the base.

GENERAL DISTRIBUTION: Greater Antilles, continental tropical America from Mexico to Brazil and Bolivia.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Thickets and clearings at chiefly middle elevations, often forming dense tangles.

A remarkable form collected in Guadeloupe in 1843 by L'Herminier has segments up to 9 cm. long (normal maximum 3.5 cm.), many of them broadened and pinnatifid toward the apex. This has not yet been found again.

Family HYMENOPHYLLACEAE

Mostly delicate epiphytic plants of moist forests (sometimes also on wet rocks, a few terrestrial). Rhizomes often slender and wide-creeping, or sometimes relatively short, decumbent to erect. Fronds sessile or stalked, erect, ascending, or pendent, attached more or less distantly in the majority of epiphytic species, chiefly fasciculate and erect in terrestrial species. Blades entire to variously subdivided, glabrous to densely hairy (the hairs simple, geminate, forked, or stellate), usually hygroscopic; tissue usually membranous and pellucid, mostly 1 cell thick (or occasionally more) and lacking stomata, the venation flabellate or pinnate, mostly free. Sori marginal; indusium a tubular to bivalved involucre, immersed in tissue to free or even short-stalked, surrounding a central sporangium-bearing stalk (the receptacle), the latter continuous with a vein; receptacle in many cases capable of indefinite growth, producing new sporangia continuously at the base, thus gradually becoming long-exserted from the mouth of the involucre, the sporangia meanwhile falling off as they mature and release their spores. Sporangia sessile, obovoid or turbinate, with a complete oblique or horizontal annulus, rupturing vertically; spores trilete, containing chlorophyll. Gametophytes green, ribbonlike or branched-filamentous, monoecious, sometimes multiplying by means of gemmae.

Genera six (following Morton, 1968) or up to 33 (according to some authors); species more than 550, chiefly tropical, a few in temperate regions. As a group, these plants are usually called "filmy ferns."

SPECIAL LITERATURE: Morton, The genera, subgenera, and sections of the Hymenophyllaceae, in Contr. U. S. Nat. Herb. 38(5): 153–214. 1968.

KEY TO THE GENERA

a. Involucre bivalved or purselike, roundish or ovate, cleft more or less deeply into two lobes ("valves"), the immersed part (if any) truncate or broadly cuneate in outline (i.e., more or less conic, not tubular); receptacle filiform or clavate, bearing sporangia toward the apex only, and usually not exserted; rhizomes always very slender and long-creeping, with scattered fronds; venation always anadromous .... 1. *Hymenophyllum*

a. Involucre narrowly or broadly tubular, the apex truncate and entire, or else with two lips less than half as long as the tube; receptacle always filiform, bearing sporangia near the base but not toward the apex, often long-exserted; rhizomes wide-creeping, contracted, or erect, the fronds scattered or clustered; venation anadromous or catadromous ...... 2. *Trichomanes*

HYMENOPHYLLUM Smith

Hymenophyllum Smith in Mém. Acad. Turin **5**: 418. 1793.

FIGURE 11.

Epiphytes of delicate texture. Rhizomes more or less filiform, wide-creeping, flexuous. Fronds scattered, ascending or pendent, always stipitate in Lesser Antillean species. Blades glabrous or hairy (the hairs simple, forked, or stellate), 1–several times pinnatifid or pinnate; rhachis terete or (more often) winged, the wings and ultimate segments of the blade flat or undulate-crispate, entire or toothed. Sori wholly immersed in the tissue to partly or entirely free.

TYPE SPECIES: *Hymenophyllum tunbrigense* (L.) Smith, based on *Trichomanes tunbrigense* L., of nearly cosmopolitan distribution.

A large taxon of nearly 300 species, of widespread distribution.

SPECIAL LITERATURE: Morton, The American species of *Hymenophyllum* section *Sphaerocionium*, in Contr. U. S. Nat. Herb. **29**: 139–201. 1947.

KEY TO THE SUBGENERA

a. Margins of the segments toothed .... Subg. *Hymenophyllum*
a. Margins of the segments entire.
  b. Fronds with hairs (at least on the margins or the veins beneath) .... Subg. *Sphaerocionium*
  b. Fronds glabrous .... Subg. *Mecodium*

Subgenus HYMENOPHYLLUM

1. **Hymenophyllum fucoides** (Sw.) Sw. in J. Bot. Schrader 1800(2): 99. 1801.

Basionym: *Trichomanes fucoides* Sw., Prodr. 136. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Leptocionium fucoides* (Sw.) C. Presl, Hymen. 27. 1844.
Hymenophyllum blepharodes C. Presl, Hymen. 32, 51. 1844. (Type from Martinique.)
Hymenophyllum torquescens van den Bosch in Nederl. Kruidk. Arch. 5(3): 178. 1863. (Type from Martinique.)
Hymenophyllum ectocarpon Fée, Mém. Fam. Foug. **11**: 115, *t. 31, fig. 1.* 1866. (Type from Guadeloupe.)

Rhizome creeping, filiform but wiry, glabrate or with a few scattered hairs. Fronds distant, dark green, erect or decurved; stipes 1–3 cm. long, dark brown, narrowly marginate, bearing scattered, dark brown pluricellular hairs (similar hairs on rhachis). Blades oblong or narrowly ovate-

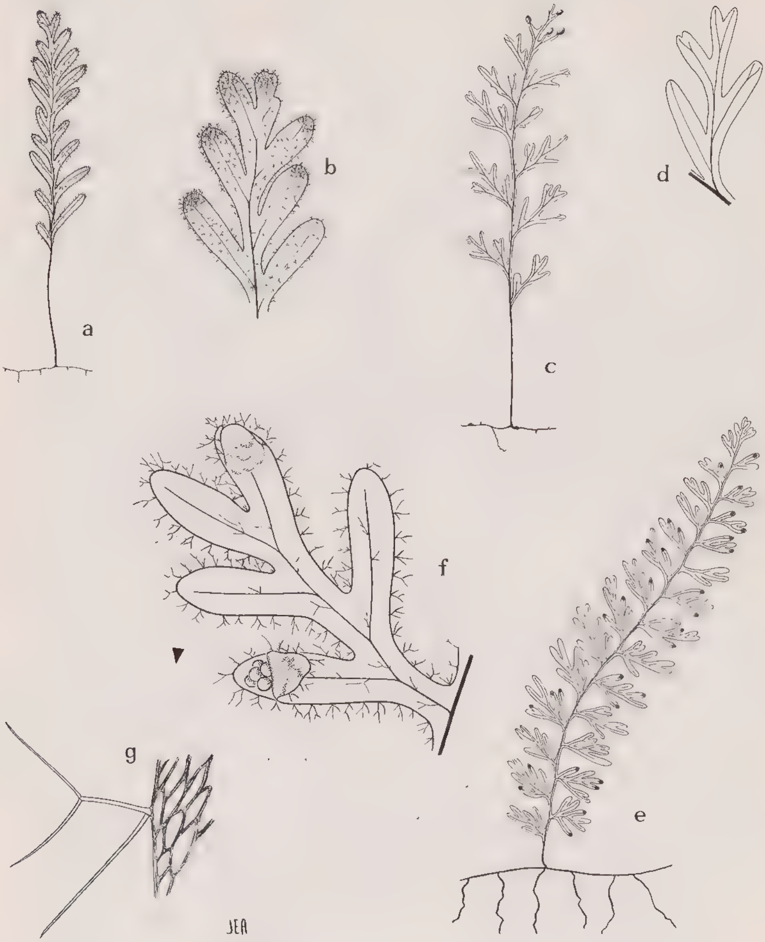

FIGURE 11. **Hymenophyllum.** a, b, *H. lanatum*: a, habit, × 0.8; b, apex of frond, showing stellate hairs on tissue, veins, and along margins, × 2.4. c, d, *H. macrothecum*: c, habit, × 0.8; d, enlarged sterile pinna showing venation, × 2.0. e–g, *H. elegans*: e, habit, × 0.8; f, enlarged fertile pinna, showing hairs on veins and margins, × 4.8; g, twice-forked marginal hair, × 52.0.

oblong, 5–12 cm. long, 1.5–4 cm. broad, acute to acuminate, pinnate-pinnatifid, with winged rhachis; pinnae 6–13 pairs, obliquely spreading, decurrent at base, deeply pinnatisect with lower segments often forked; ultimate divisions linear-oblong, sharply serrulate especially at the rounded or notched apex, mostly 1–1.5 mm. broad. Sori confined to the upper several pinnae, 1 to several on each pinna, nearly always on acroscopic segments, the fertile segments often prolonged on one side beyond the attachment of the sorus; involucre elliptic or ovate-elliptic in outline; valves lacerate-denticulate and free nearly to the base.

General Distribution: Greater Antilles except Puerto Rico; continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Mossy banks, logs, buttresses, and the moss-covered trunks and branches of trees in moist forests at higher elevations.

The Lesser Antillean population differs from typical Jamaican plants in having more numerous sori (several or more on each pinna instead of the usual one found on basal segments only), and in having twisted and more deeply lacerate involucral valves. It could well be recognized as a geographic variety, except that the relationships between these forms and the several continental variants have yet to be worked out.

Subgenus SPHAEROCIONIUM

Key to the Species

a. Hairs borne only on veins and margins (lacking from tissue between the veins).
  b. Stipes 0.2–0.3 mm. in diameter; blades usually less than 3 cm. broad (very rarely 3–4 cm.).
    c. Rhachis not winged to the base.
      d. Pinnae (at least the lower ones) stalked; hairs found on margins only . . . . 2. *H. lineare*
      d. Pinnae all sessile or adnate; hairs occurring on veins as well as on the margins . . . . 3. *H. elegans*
    c. Rhachis winged to the base, the stipe also winged, at least above . . . . 4. *H. hirsutum*
  b. Stipes 0.3–0.6 mm. in diameter; blades usually over 3 cm. broad (to 7 cm.).
    e. Hairs present on veins of upper surface; marginal hairs variously stellate; involucral valves rounded at the apex . . . . . 5. *H. hirtellum*
    e. Hairs lacking from veins of upper surface; marginal hairs simple or forked at the base; involucral valves somewhat acute.
      f. Segments flat, the tissue dark green, coarse . . 6. *H. microcarpum*
      f. Segments undulate-crispate, the tissue light green, delicate . . . . 7. *H. valvatum*
a. Hairs borne on the tissue between the veins, as well as on the veins and margins.

g. Blades flat, the veins not winged at right angles to the plane of the frond.
  h. Pinnae mostly simple, not overlapping; stipes filiform, 0.2–0.25 mm. in diameter.
    i. Segments mostly 2.5 mm. broad or more, with long-stalked stellate hairs along the margins; stipe hairs mostly simple; blades 3.5–17 cm. long . . . . 8. *H. latifrons*
    i. Segments mostly 1–1.7 mm. broad, with short-stalked stellate hairs along the margins; stipe hairs mostly stellate; blades 2–6 cm. long . . . . 9. *H. lanatum*
  h. Pinnae lobed, mostly overlapping; stipes stouter, 0.4–0.6 mm. in diameter; blades 12–30 cm. long . . . . 10. *H. sieberi*
g. Blades not flat, the veins winged at right angles to the plane of the frond; blades usually 10–30 cm. long, laxly pendent . . . . 11. *H. sericeum*

2. **Hymenophyllum lineare** (Sw.) Sw. in J. Bot. Schrader **1800**(2): 100. 1801.

Basionym: *Trichomanes lineare* Sw., Prodr. 137. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Sphaerocionium lineare* (Sw.) C. Presl, Hymen. 34. 1844.
  Hymenophyllum atrovirens Fée, Mém. Fam. Foug. 11: 120, *t. 30, fig. 4.* 1866. (Type from Guadeloupe.)
  Hymenophyllum fucoides var. *atrovirens* (Fée) Duss, Foug. & Lyc. Antill. Franc. 7. 1903, with regard to name.
  Hymenophyllum lineare var. *dussii* Christ ex Duss, Foug. & Lyc. Antill. Franc. 9. 1903. (Type from Guadeloupe.)

Rhizome creeping, filiform, sparsely clothed with yellowish-brown hairs. Fronds ascending to erect; stipes 1–3(–4.5) cm. long, filiform, terete, bearing a few simple or forked hairs. Blades narrowly oblong-lanceolate to ovate, 4–9(–22) cm. long, 1.5–3(–5) cm. broad; rhachis narrowly winged above; pinnae mostly 8–10 on a side, alternate, the lowest short-stalked, the upper ones adnate, pinnatifid to pinnate-pinnatifid; ultimate divisions 0.5–0.8 mm. broad, the marginal hairs simple or forked at the base. Sori numerous, terminating most of the segments on upper pinnae; involucral valves suborbicular, ca. 1 mm. in diameter, broader than the segments, and ciliate with simple hairs.

General Distribution: Greater Antilles, Central America.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Guadeloupe, St. Vincent.

Habitat: Mossy tree trunks at higher elevations.

3. **Hymenophyllum elegans** Sprengel in L., Syst. Veg. **4**: 133. 1827.

Type: *Sello*, from Brazil.
Syn.: *Hymenophyllum cruegeri* C. Müll. in Bot. Zeit. **1854**: 722. 1854. (Type from Trinidad.)
  Hymenophyllum hirsutum sensu Griseb., Fl. Br. W. Ind. 659. 1864 (and other authors), not Sw., 1801.

Sphaerocionium elegans (Sprengel) Copel. in Philip. J. Sci. **67**: 32. 1938.
Sphaerocionium cruegeri (C. Müll.) Copel. in Philip. J. Sci. **67**: 32. 1938.

Rhizome creeping, filiform, sparsely hairy. Fronds pendent, determinate; stipes 0.5–2 cm. long, filiform, terete, bearing a few simple or forked hairs. Blades lanceolate to linear, 2–17 cm. long, 0.9–2 cm. broad, acuminate; rhachis winged above on one or both sides by the decurrent bases of the pinnae; pinnae 7–20 pairs, spreading, all sessile or adnate, subflabellate, pinnatifid, the costae broadly winged; ultimate segments 1–1.5 mm. broad with a few forked hairs on the veins, the marginal hairs abundant, mostly once- or twice-forked, a few simple, stellate, or bistellate. Sori numerous, borne on all the upper segments of fertile fronds; involucral valves orbicular, 0.7–1 mm. in diameter, equalling or narrower than the segments, clothed with numerous stellate hairs.

GENERAL DISTRIBUTION: Cuba, Hispaniola, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Guadeloupe, St. Vincent, Grenada.

HABITAT: On shaded mossy cliffs or tree trunks at high elevations.

4. **Hymenophyllum hirsutum** (L.) Sw. in J. Bot. Schrader **1800**(2): 99. 1801.? 1802

Basionym: *Trichomanes hirsutum* L., Sp. Pl. **2**: 1098. 1753.
Type: Plumier, Tr. Foug. *t. 50, fig. B,* from an unknown locality, presumably either Martinique or Hispaniola.
Syn.: *Trichomanes ciliatum* Sw., Prodr. 136. 1788. (Type from Jamaica.)
Hymenophyllum ciliatum (Sw.) Sw. in J. Bot. Schrader **1800**(2): 100. 1801.? 1802?
Sphaerocionium ciliatum (Sw.) C. Presl, Hymen. 34. 1844.
Sphaerocionium hirsutum (L.) C. Presl, Hymen. 34. 1844.
Sphaerocionium grevilleanum C. Presl, Hymen. 34. 1844. (Type from St. Vincent.)
Sphaerocionium vestitum C. Presl, Hymen. 58. 1844. (Syntypes from Martinique and Brazil.)
Hymenophyllum remotum van den Bosch in Nederl. Kruidk. Arch. **4**: 413. 1859. (Type from St. Vincent.)
Hymenophyllum elegantissimum Fée, Mém. Fam. Foug. **11**: 118, *t. 29, fig. 2.* 1866. (Type from Guadeloupe.)
Sphaerocionium elegantissimum (Fée) Copel. in Philip. J. Sci. **67**: 34. 1938.

Extensive further synonymy exists, based on types from Central and South America (see Morton in Contr. U.S. Nat. Herb. **29**: 155, 156. 1947).

Rhizome wide-creeping, filiform, loosely clothed with reddish, simple hairs; stipes mostly 1.5–3 cm. long, broadly winged at least above the middle (often nearly to the base), sparsely stellate-hairy. Blades ovate to oblong or oblong-lanceolate, mostly 3–9 cm. long, 1.5–3 cm. broad; rhachis broadly winged throughout and stellate-hairy; pinnae 6–12 on a side, alternate, deeply pinnatifid, the costae broadly winged; ultimate segments 1–1.3 mm. broad, bearing scattered stellate hairs on the veins and bistellate or twice-forked hairs along the margins. Sori chiefly solitary on segments of upper pinnae; involucral valves suborbicular, ca. 1.5 mm. long and broad (about as broad as the segments), ciliate with forked or twice-forked hairs.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Mossy logs and tree trunks at chiefly middle elevations.

5. **Hymenophyllum hirtellum** Sw. in J. Bot. Schrader **1800**(2): 101. 1801.

Type: *Swartz*, from Jamaica.

Syn.: *Trichomanes hirtellum* (Sw.) Poiret in Lam., Encycl. Méth. Bot. **8**: 76. 1808.
Sphaerocionium hirtellum (Sw.) C. Presl, Hymen. 34. 1844.

Rhizome wide-creeping, 0.4–0.5 mm. in diameter, clothed with numerous reddish hairs. Fronds determinate; stipes 3–10 cm. long, 0.3–0.7 mm. in diameter, narrowly winged above (sometimes more broadly so in var. *gratum*), bearing numerous forked or stellate hairs. Blades ovate to ovate-lanceolate (or to lance-linear in var. *vincentinum*), mostly 7–27 cm. long, 3–7 cm. broad; rhachis narrowly winged throughout; pinnae 7–22 pairs, deeply pinnatisect, the pinnules deeply pinnatifid or (in Lesser Antillean specimens) less divided; ultimate divisions linear, mostly 2.5–5 mm. long (sometimes longer), 1–1.7 mm. broad, simple or forked, the hairs of the rhachis and veins stellate, those of the margins mostly forked or twice-forked, a few stellate. Sori numerous, chiefly on the upper pinnae; involucral valves about as broad as the segments, suborbicular, long-ciliate, the hairs mostly forked at the base, some forked again.

In its typical form, this species is confined to the Greater Antilles; however, numerous specimens of this affinity have been collected in the Lesser Antilles. In the present treatment these are assigned to two varieties, one widespread throughout the islands, the other apparently confined to St. Vincent and Grenada. These variants resemble the two varieties of *Hymenophyllum maxonii* Christ ex Morton from Guatemala; however, they have not only probably evolved independently of *H. maxonii* ,they are also less homogeneous. Although some of the variants suggest a relationship with *H. hirsutum*, it is difficult to expand the concept of this species enough to include them. They would be equally difficult to treat as independent species. Therefore, the most convenient arrangement is to consider them varieties of *H. hirtellum*, differing chiefly in the degree of dissection of the blades, in the sometimes more broadly winged stipes, and in the width of the ultimate segments. In addition, the elongate pendent fronds of var. *vincentinum* are especially distinctive, though intermediates with var. *gratum* exist.

The two varieties can be distinguished as follows:

a. Fronds spreading, ascending or erect; blades lance-ovate to ovate, mostly not over 12 cm. long but reaching 7 cm. in width; stipes narrowly marginate to broadly winged above; sori to 1.6 mm. broad .... 5a. var. *gratum*

a. Fronds laxly pendent; blades linear or lance-linear, to 27 cm. long, mostly 3–4.5 cm. broad (rarely to 6 cm.); stipes very narrowly marginate, never truly winged; sori not more than 1.2 mm. broad .... 5b. var. *vincentinum*

5a. **Hymenophyllum hirtellum var. gratum** (Fée) Proctor in Rhodora **68**: 465. 1966.

Basionym: *Hymenophyllum gratum* Fée, Mém. Fam. Foug. **11**: 118, *t. 30, fig. 1.* 1866.

Type: *L'Herminier in 1861*, from Guadeloupe.

Syn.: *Hymenophyllum hirsutum* var. *gratum* (Fée) Proctor in Brit. Fern Gaz. 9(3): 73. 1962.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Mossy tree trunks at higher elevations.

Some St. Lucia plants are intermediate between this variety and the following.

5b. **Hymenophyllum hirtellum var. vincentinum** Proctor in Rhodora **68**: 465. 1966.

Type: *Proctor 25987*, from southeast slopes of the Soufriere Volcano, St. Vincent (IJ; isotypes A, U, USF).

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Vincent; Grenada, *Sherring s.n., in 1891* (IJ).

Habitat: Mossy tree trunks at middle elevations.

6. **Hymenophyllum microcarpum** Desvaux in Mém. Soc. Linn. Paris **6**: 333. 1827.

Type: Collector not stated, ex *Herb. Desvaux*, from Hispaniola (P).

Syn.: *Mecodium microcarpum* (Desvaux) Copel. in Philip. J. Sci. **67**: 25. 1938.

Sphaerocionium microcarpum (Desvaux) Copel. in Philip. J. Sci. **67**: 34. 1938.

Rhizome wide-creeping, 0.3–0.5 mm. in diameter. Fronds erect, determinate; stipes 3–9 cm. long, 0.5 mm. in diameter or more, broadly winged above, bearing stellate hairs with inflated stalks. Blades ovate to ovate-lanceolate, 7.5–20 cm. long, 4–10 cm. broad, acuminate; rhachis broadly winged, bearing 3- to 5-rayed stellate hairs; pinnae 12–14 pairs, adnate, deeply bipinnatifid; ultimate segments 1–1.5 mm. broad, the marginal hairs simple or forked at the base. Sori confined to upper part of frond; involucral valves ovate to oblong, 1.2–1.4 mm. long, ca. 0.8 mm. wide, somewhat acute, entire or denticulate, naked or sparingly ciliate with short, simple hairs.

GENERAL DISTRIBUTION: Greater Antilles, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Dominica, *Ramage* (BM).

HABITAT: Mossy tree trunks and logs, or sometimes on wet shaded rocks, at middle to higher elevations; plants very rare.

The sole specimen known from the Lesser Antilles was collected at Laudat, Dominica on March 28, 1888. Future collectors should watch for this species.

7. **Hymenophyllum valvatum** Hook. & Grev., Ic. Fil. 2: *t. 219.* 1831.

Type: *Jameson*, from Ecuador.
Syn: *Hymenophyllum francavillei* van den Bosch in Nederl. Kruidk. Arch. 4: 411. 1859. (Type from Guadeloupe.)
Sphaerocionium valvatum (Hook. & Grev.) Copel. in Philip. J. Sci. 67: 31. 1938.

Rhizome wide-creeping, rather wiry, clothed with spreading golden-brown hairs. Fronds distant, erect, determinate, with delicate, translucent tissue; stipes 2–8 cm. long, usually not winged, bearing a few simple or forked hairs. Blades ovate-lanceolate, 4–15 cm. long, 3–5 cm. broad, acuminate; rhachis winged throughout, glabrous on upper side, sparsely hairy beneath, the wings 0.6–1 mm. broad on each side, lightly undulate, bearing forked hairs along the margin; pinnae spreading, 8–23 on each side, alternate, deeply pinnatifid; ultimate segments 1.2–1.5 mm. broad, undulate-crispate, the hairs of the veins beneath simple or a few once-forked. Sori often numerous, borne on both apical and basal segments of the upper pinnae; involucral valves ovate, somewhat acute, ca. 1.5 mm. long, sparingly ciliate with simple hairs.

GENERAL DISTRIBUTION: South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Vincent.

HABITAT: On mossy trees at high elevations; plants rare.

8. **Hymenophyllum latifrons** van den Bosch in Nederl. Kruidk. Arch. 4: 407. 1859.

Type: *Perottet,* from Guadeloupe.

Rhizome filiform or capillary. Fronds pendent, of delicate texture; stipes filiform, 0.5–1.5 cm. long, winged at the apex, deciduously hairy with mostly simple hairs. Blades ovate to linear, 3.5–17 cm. long, 1.5–3 cm. broad; rhachis broadly winged throughout, the wings mostly 1.5 mm. broad on each side; pinnae ascending, 7–20 on each side, mostly simple and linear or linear-oblong, 2.5–3 mm. broad, or sometimes several of them bifid or shallowly pinnatifid with 2 or 3 lobes, the hairs of all parts stellate and long-stalked (stalks mostly 0.5–0.7 mm. long). Sori narrower than the segments; involucral valves rounded, ca. 1.2 mm. long and 1.5 mm. broad, glabrous except for the ciliate margins, the hairs simple or stellate and long-stalked.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: On mossy tree limbs in moist woodlands at high elevations; plants rare.

9. **Hymenophyllum lanatum** Fée, Mém. Fam. Foug. 11: 116, *t. 31, fig. 3.* 1866.

Type: *L'Herminier in 1861,* from Sainte-Rose, Guadeloupe.
Syn.: *Sphaerocionium lanatum* (Fée) Copel. in Philip. J. Sci. 67: 31. 1938.

Rhizome filiform or capillary. Fronds pale gray-green, determinate, pendent, overlapping; stipes filiform, 1–3 cm. long, minutely winged at apex only, deciduously clothed with stellate hairs. Blades ovate to linear-oblong, 2–6 cm. long, 1–1.8 cm. broad; rhachis narrowly winged throughout, the wings not more than 0.7 mm. wide on either side; pinnae 7–20 to a side, ascending, mostly simple and linear, 5–11 mm. long, 1.5–1.7 mm. broad, the hairs of all parts stellate with short stalks (stalks 0.25–0.30 mm. long). Sori few, apical on and narrower than the segments; involucral valves rounded with a cuneate base, ca. 1 mm. long, stellate-hairy on the surfaces, and also ciliate with stellate, long-stalked hairs.

General Distribution: Greater Antilles, Guatemala, Venezuela.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, St. Lucia, St. Vincent, Grenada.

Habitat: On shaded tree trunks, stumps, and logs in moist forests, at mostly middle elevations.

This species will probably be found in suitable habitats on islands other than those listed; it is very inconspicuous and easily overlooked.

10. **Hymenophyllum sieberi** (C. Presl) van den Bosch in Nederl. Kruidk. Arch. **4**: 414. 1859.

Basionym: *Sphaerocionium sieberi* C. Presl, Hymen. 58. 1844.
Type: *Kohaut, Sieber Exsicc. 71*, from Martinique.
Syn.: *Hymenophyllum interruptum* sensu Duss, Foug. & Lyc. Antill. Franc. 8. 1903, not Kunze, 1834.

Rhizome finely wiry, hairy. Fronds pendent, indeterminate; stipes 1.5–8 cm. long, 0.4–0.5 mm. in diameter, winged above the middle, deciduously hairy, the hairs simple, forked, or stellate. Blades linear or oblong, 12–30(–50) cm. long, 2.5–8 cm. broad; rhachis winged throughout, the wings less than 1 mm. broad; pinnae up to 25(–40) on a side, alternate or subopposite, close or somewhat overlapping, broadly lanceolate, 2–5 cm. long, up to 1.8 cm. broad, acuminate, pinnatifid with lobed segments or sometimes nearly 2-pinnatifid; ultimate segments mostly not more than 1 mm. long and less than 1 mm. broad, the hairs of veins and tissue few, stellate, subsessile, the marginal hairs forked or stellate, relatively long-stalked, or a few bistellate. Sori about as broad as the fertile segments; involucral valves rounded, to 1.5 mm. long, bearing long-stalked forked or stellate hairs along the outer margins.

General Distribution: Puerto Rico, Mexico, Central America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Martinique.

Habitat: Mossy cliffs and tree trunks at high elevations; plants rare.

11. **Hymenophyllum sericeum** (Sw.) Sw. in J. Bot. Schrader 1800(2): 99. 1801.

Basionym: *Trichomanes sericeum* Sw., Prodr. 136. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Sphaerocionium sericeum* (Sw.) C. Presl, Hymen. 34. 1844.

Rhizome filiform, loosely clothed with spreading hairs. Fronds pendent, indeterminate; stipes 2.5–5 cm. long, not winged, deciduously clothed with a mixture of simple, forked, and stellate hairs. Blades essentially linear or very narrowly oblong, mostly 10–30 cm. long, 2–3.5 cm. broad; rhachis narrowly winged above on alternate sides by the decurrent bases of the pinnae; pinnae usually 20–30 on a side, alternate, ascending, close or approximate, ovate-lanceolate, 1.5–2.5 cm. long, acute, pinnatifid; segments in 4–5 pairs, mostly simple, ca. 1 mm. broad, densely clothed throughout with stellate, subsessile hairs, the veins on both sides bearing 2 rather narrow vertical green wings. Sori few, confined to tips of the upper pinnae; involucral valves about as wide as the segments, ca. 1 mm. long, rounded at the apex, densely stellate-hairy.

General Distribution: Greater Antilles except Puerto Rico.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Mossy tree trunks and logs in moist forests at high elevations; plants rare.

Subgenus MECODIUM

Key to the Species

a. Stipes narrowly winged or marginate above; tissue not undulate or crispate; ultimate segments mostly 1 mm. broad or more.
  b. Blades less than 2.5 cm. broad (usually 1.5–2 cm.), coarsely 2-pinnatifid, the segments rather few .... 12. *H. macrothecum*
  b. Blades usually 2.5–6 cm. broad, finely 3- to 4-pinnatifid, the segments relatively numerous .... 13. *H. polyanthos*
a. Stipes not at all winged or marginate; tissue strongly undulate or crispate; ultimate segments 0.5–0.8 mm. broad, densely crowded; fronds laxly pendent .... 14. *H. undulatum*

12. **Hymenophyllum macrothecum** Fée, Mém. Fam. Foug. **11**: 115, *t. 31, fig. 2.* 1866, as *macrothecium.*

Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Hymenophyllum vincentinum* Baker in Ann. Bot. **5**: 164, *t. 10.* 1891. (Type from St. Vincent.)
Mecodium macrothecum (Fée) Copel. in Philip. J. Sci. **67**: 25. 1938.

Rhizome filiform, sparingly rusty-hairy at nodes. Fronds pendent, determinate; stipes 1–3.5 cm. long, much shorter than the blades, filiform, narrowly winged or brownish-marginate above. Blades ovate- or linear-oblong, 2–15 cm. long, 1.5–2(–2.5) cm. broad, truncate or somewhat acute at the apex, 2-pinnatifid; rhachis narrowly winged throughout; pinnae mostly 4–10 on each side, alternate, rather distant, obliquely spreading, inequilateral, all sessile and decurrent, each with 2–4(–6) linear, entire segments, these mostly 2–5 mm. long and 1–1.5 mm. broad, often forked at the apex. Sori few, occurring near the apex of the frond; involucral valves much broader than the fertile segments, ovate-oblong, somewhat acute, entire, ca. 2(–3) mm. long.

General Distribution: Puerto Rico.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, St. Vincent, Grenada.

Habitat: On shaded tree trunks and logs at middle elevations.

13. **Hymenophyllum polyanthos** (Sw.) Sw. in J. Bot. Schrader 1800(2): 102. 1801.

Basionym: *Trichomanes polyanthos* Sw., Prodr. 137. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Trichomanes clavatum* Sw., Prodr. 137. 1788. (Type from Jamaica.)
Hymenophyllum clavatum (Sw.) Sw. in J. Bot. Schrader **1800**(2): 101. 1801.
Hymenophyllum grevilleanum C. Presl, Hymen. 32. 1844. (Syntypes from Jamaica, St. Vincent, and Surinam.)
Hymenophyllum breutelii van den Bosch in Nederl. Kruidk. Arch. 5(3): 154. 1863. (Lectotype from St. Kitts.)

Hymenophyllum polyanthos var. *andinum* (van den Bosch) Urban in Engl. Bot. Jahrb. 24: 85. 1897, with regard to name, ? not *H. andinum* van den Bosch, 1859. (Cited from Grenada by Urban.)

Hymenophyllum polyanthos var. *blumeanum* (Sprengel) Urban in Engl. Bot. Jahrb. 24: 85. 1897, with regard to name, not *H. blumeanum* Sprengel in L., Syst. Veg. 4: 131. 1827. (Cited from Guadeloupe by Urban.)

Hymenophyllum mazei Fourn. ex Christ in Urban, Engl. Bot. Jahrb. 24: 85. 1897; Duss, Foug. & Lyc. Antill. Franc. 6. 1903. (Type from Guadeloupe.)

Hymenophyllum polyanthos var. *clavatum* (Sw.) Duss in Foug. & Lyc. Antill. Franc. 6. 1903.

Mecodium polyanthos (Sw.) Copel. in Philip. J. Sci. 67: 19. 1938.

The synonymy of this species is vastly more extensive than indicated here, with many names based on variants of unknown range or significance from various parts of the world. The confusion reigning in this taxon can be reduced to order only by thorough monographic study.

Rhizome finely wiry, laxly clothed with brown hairs. Fronds pellucid green, glabrous throughout; stipes much shorter than the blades, brownish-marginate or narrowly winged above. Blades linear-oblong to deltate-ovate, mostly 2.5–6 cm. broad, deeply 3- to 4-pinnatifid; rhachis slender, dark brown, narrowly winged or marginate throughout; pinnae oblique-spreading, alternate (the basal ones sometimes reduced and apart); ultimate divisions linear or linear-oblong, ca. 1 mm. broad, the costae evenly winged. Sori mostly terminating segments in the upper part of fertile blades; involucral valves rounded-ovate, obtuse or somewhat acute, scarcely broader than the segments.

When dealing with such a polymorphic species, it is probably unwise to attempt the naming of infraspecific variants when there is no recourse to an authoritative monographic revision. However, in the Lesser Antilles *H. polyanthos* occurs in two rather distinctive forms which seem worthy of recognition. These can be distinguished as follows:

a. Fronds of obviously determinate growth, mostly 5–15 cm. long, normally erect or ascending in habit and of more or less firm texture; involucral valves ovate, to 2 mm. long, the receptacle normally included .... 13a. var. *polyanthos*

a. Fronds often seeming of indeterminate growth, reaching 35 cm. in length, pendent in habit and of flaccid texture; involucral values orbicular (sometimes wider than long), not over 1.2 mm. long, the receptacle often exserted .... 13b. var. *protrusum*

13a. Hymenophyllum polyanthos var. polyanthos

General Distribution: Pantropical.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On mossy tree trunks, logs, and (less commonly) rocks in moist forests at middle to higher elevations; plants common.

13b. Hymenophyllum polyanthos var. protrusum (Hook.) Farwell in Amer. Midl. Nat. 12: 249. 1931.

Basionym: *Hymenophyllum protrusum* Hook., Sp. Fil. 1: 104, *t. 37-b.* 1844.
Syntypes: *Sinclair*, from Central America, and *Purdie*, from Jamaica.
Syn.: *Adiantum decurrens* Jacq., Coll. Bot. 2: 103, *t. 2, figs. 1, 2.* 1788. (Type from Martinique.)
  Hymenophyllum decurrens (Jacq.) Sw. in J. Bot. Schrader **1800**(*2*): 99. 1801.
  Trichomanes decurrens (Jacq.) Poiret in Lam., Encycl. Méth. Bot. Suppl. 8: 71. 1808.
  Hymenophyllum decurrens [var.] *α jacquinianum* C. Presl, Hymen. 32. 1844, nomen illegit.
  Hymenophyllum kohautianum C. Presl, Hymen. 32, 56. 1844. (Type from Martinique.)
  Hymenophyllum martinicense van den Bosch in Nederl. Kruidk. Arch. 4: 389. 1859. (Type from Martinique.)
  Mecodium protrusum (Hook.) Copel. in Philip. J. Sci. **67**: 25. 1938.

GENERAL DISTRIBUTION: Jamaica, Hispaniola, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Martinique, St. Vincent.

HABITAT: On mossy trees and logs in moist forests at chiefly middle elevations; plants rare.

14. Hymenophyllum undulatum (Sw.) Sw. in J. Bot. Schrader 1800(2): 101. 1801.

Basionym: *Trichomanes undulatum* Sw., Prodr. 137. 1788.
Type: *Swartz*, from Jamaica (BM).
Syn.: *Hymenophyllum flaccidum* van den Bosch in Nederl. Kruidk. Arch. 4: 400. 1859.
  Hymenophyllum crispum sensu Jenman, Ferns Br. W. Ind. & Guiana 10. 1898, not Kunth in H. B. K., 1815.
  Hymenophyllum axillare sensu Duss, Foug. & Lyc. Antill. Franc. 6. 1903, not Sw., 1801.
  Mecodium undulatum (Sw.) Copel. in Philip. J. Sci. **67**: 26. 1938.

Rhizome filiform or capillary, bearing flexuous brown hairs. Fronds numerous, laxly pendent and densely overlapping, of indeterminate growth; stipes short, dark brown, filiform. Blades narrowly oblong to linear, often forked or with elongate branches, 4–15 cm. long, 0.8–2.5 cm. broad, fully-pinnate at base, pinnatisect above; pinnae numerous, alternate, lax, densely overlapping, deeply 2-pinnatifid; ultimate divisions oblong, entire, crowded and more or less crispate-undulate, mostly 0.5–0.8 mm. broad, sometimes forked at the apex. Sori numerous, often terminating most of the segments in the apical half of the blade; involucral valves suborbicular, free nearly to the base, about the same width as the fertile segments.

General Distribution: Greater Antilles, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, *Duss 4273* (gh).

Habitat: On mossy tree trunks and rotten logs in moist woodlands at high elevations; plants very rare.

TRICHOMANES Linnaeus

Trichomanes L., Sp. Pl. 2: 1097. 1753. Figure 12.

Epiphytic or terrestrial ferns of various habit, either intricate and minute with filiform rhizomes, scandent with distant fronds of small to medium size, or terrestrial with short-creeping to erect rhizomes, fasciculate fronds, and strong, wiry roots. Fronds erect, spreading, or pendent, sometimes densely overlapping, subsessile to long-stipitate. Blades various, from minute, orbicular, entire, and flabellate-veined to elongate, much subdivided, and pinnately veined; glabrous or hairy, the hairs simple, forked, or stellate, borne mostly on the margins and vascular parts. Sori immersed in tissue to entirely free, in shape tubular or narrowly cylindric-cuneate to salverform, the mouth usually truncate and entire or sometimes with a bilobed apex; receptacle filiform, usually long-exserted with age. Sporangia borne at or near the base.

Type species: *Trichomanes scandens* L., of the Greater Antilles.

A large, diverse genus of perhaps 250 species, divided by some writers into a number of genera. The majority of species occur in moist tropical regions, but a few are found in temperate areas, chiefly in the Southern Hemisphere.

Special literature: Wessels Boer, The New World species of *Trichomanes* sect. *Didymoglossum* and *Microgonium*, in Acta Bot. Neerl. 11: 277–330, *figs. 1–35*. 1962.

Key to the Subgenera

a. Venation anadromous; blades 2- to 4-pinnatifid; marginal hairs lacking.
  b. Rhizomes long-creeping with distant fronds; plants epiphytic or sometimes on rocks .... Subg. *Trichomanes*
  b. Rhizomes decumbent to erect, supported by strong, wiry roots, the fronds fasciculate; plants terrestrial .... Subg. *Pachychaetum*
a. Venation catadromous; blades simple, pinnatifid, or pinnate-pinnatifid; simple or stellate marginal hairs often present.
  c. False (i.e., unconnected) veins between the true veins or submarginal; blades simple to bipinnatifid, mostly less than 5 cm. long; plants epiphytic or sometimes on rocks .... Subg. *Didymoglossum*
  c. False veins absent (cross-veinlets present in *T. pinnatum*); blades never

simple, mostly pinnatifid to once-pinnate (bipinnatifid in *T. alatum*), usually more than 5 cm. long (up to 30 cm. or more); plants terrestrial or epiphytic .... Subg. *Achomanes*

Subgenus TRICHOMANES

Key to the Species

a. Rhizomes filiform, 0.2 mm. thick or less; fronds 5–15 cm. long .... 1. *T. hymenophylloides*

a. Rhizomes cordlike, 1 mm. thick or more; fronds often 20–50 cm. long (rarely less than 20 cm.) .... 2. *T. radicans*

1. **Trichomanes hymenophylloides** van den Bosch in Nederl. Kruidk. Arch. 5(3): 209. 1863.

Type: *Guilding*, from St. Vincent (GH, isotype).

Syn.: *Trichomanes pyxidiferum* sensu Hook. & Grev., Ic. Fil. 2: *t. 206*. 1831, not L., 1753.

Trichomanes leptophyllum van den Bosch in Nederl. Kruidk. Arch. 4: 363. 1859, not A. Cunn., 1836.

Vandenboschia hymenophylloides (van den Bosch) Copel. in Philip. J. Sci. 67: 53. 1938.

Rhizome filiform, wide-creeping, clothed with numerous minute, dark brown, hairlike rhizoids. Fronds numerous, distant, ascending or semipendent, the tissue light green, thinly membranous, and essentially glabrous; stipes mostly 1–4.5 cm. long, slender, narrowly winged above. Blades oblong to ovate, 3–10 cm. long, 1.5–5 cm. broad, acute or abruptly acuminate at apex, very deeply 3-pinnatifid; rhachis narrowly winged, and all the vascular parts distantly and obscurely glandular-setulose; primary division alternate, ascending, secondary divisions rather few, distant, oblique; ultimate segments 0.8–1.2 mm. broad, linear, simple or forked, minutely notched (emarginate) at the tips. Sori few, distant, subaxillary; involucres narrowly cylindric, winged, the apex abruptly flaring.

General Distribution: Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Usually epiphytic, especially on the trunks of tree-ferns, or rarely on wet rocks, at mostly middle elevations.

2. **Trichomanes radicans** Sw. in J. Bot. Schrader 1800(2): 97. 1801.

Type: *Swartz*, from Jamaica.

Syn.: *Trichomanes scandens* sensu Hedwig, Fil. Gen. & Sp. *t. 6*. 1799, not L., 1753. (Swartz cited Hedwig's plate of "*T. scandens*" as illustrating his species *T. radicans*.)

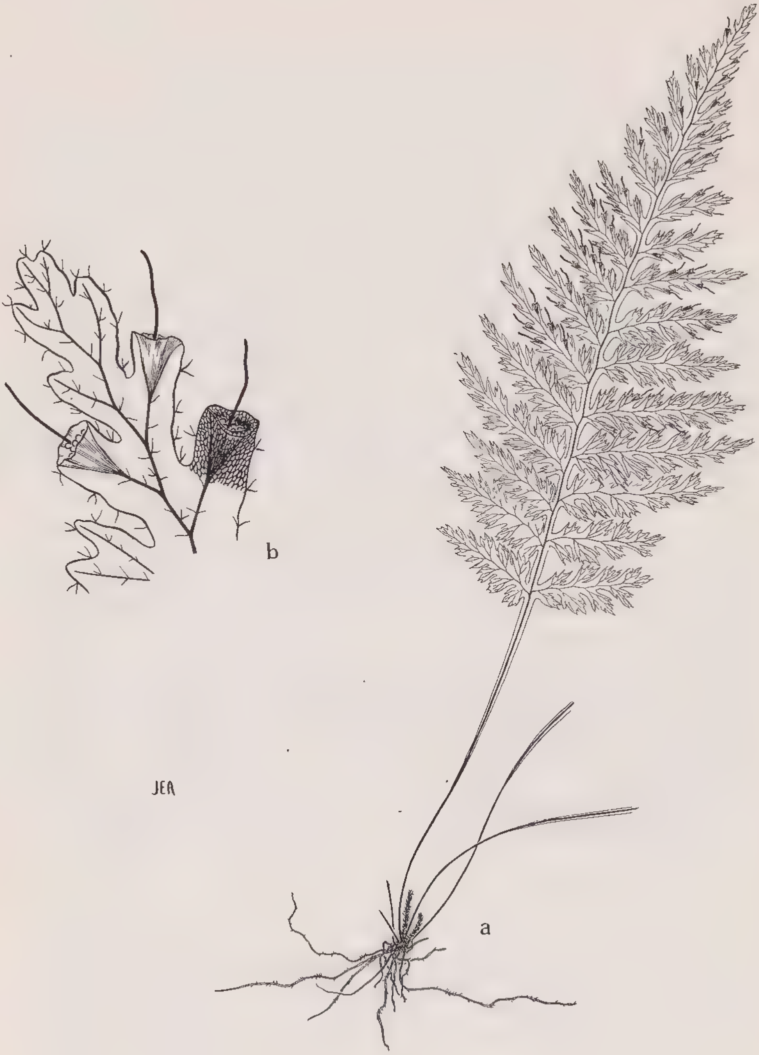

FIGURE 12. **Trichomanes.** a, b, *T. alatum*: a, habit, × 0.8; b, apical portion of frond, showing sori immersed in tissue, × 4.0.

Rhizome wide-creeping, 1–2 mm. in diameter, densely clothed with small, blackish, hairlike rhizoids which adhere to the substrate. Fronds distant, arching or spreading, the tissue dark green, membranous, and semi-opaque; stipes relatively short, mostly 0.5–5 cm. long, somewhat winged above, sparsely clothed with deciduous, brown, simple hairs. Blades glabrous, lance-oblong to narrowly ovate, mostly 15–40 cm. long, 5–20 cm. broad, acuminate at the apex, 3- to 4-pinnatisect; rhachis and all divisions narrowly winged; pinnae numerous, close or overlapping, inequilateral at base and acuminate at apex; ultimate divisions very numerous, close, linear-oblong, ca. 1 mm. broad, the tips blunt, truncate, or forked. Sori numerous, subaxillary, stalked or sessile; involucres tubular or narrowly funnel-shaped, marginate or winged on the sides, abruptly but narrowly flaring at the slightly bilobed mouth.

General Distribution: Greater Antilles, continental tropical America; also widespread in various forms in the Old World tropics.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Martinique, Grenada, all as reported by Maxon (1926); also Fée (1866) and Duss (1903) reported the same species from Guadeloupe and Martinique. I have seen no actual specimens from the Lesser Antilles.

Habitat: Moist rocks and tree trunks in deep shade at middle elevations; plants apparently very rare in the Lesser Antilles.

Subgenus PACHYCHAETUM

Key to the Species

a. Fronds chiefly 15–30 cm. long, the stipes 0.5–1.5 mm. in diameter (rarely more); rhachis and costae not winged, the divisions not decurrent; involucre truncate at the apex .... 3. *T. rigidum*

a. Fronds up to 60 cm. long or more, the stipes 1.5–3 mm. in diameter; rhachis and costae winged by the decurrent tissue of the divisions (pinnae and pinnules); involucre abruptly flaring at the apex .... 4. *T. elegans*

3. **Trichomanes rigidum** Sw., Prodr. 137. 1788; Fl. Ind. Occ. 3: 1738. 1806.

Type: *Swartz*, from Jamaica.
Syn.: *Trichomanes krugii* Christ ex Urban in Engl. Bot. Jahrb. **24**: 90. 1897. (Syntypes from Cuba, Martinique, St. Vincent, and Grenada.)
Selenodesmium rigidum (Sw.) Copel. in Philip. J. Sci. **67**: 81. 1938.

Rhizome decumbent, ascending, or erect, bearing numerous wiry prop roots and clothed at apex with stiff, lustrous brown hairs. Fronds usually fasciculate (or occasionally somewhat separate with elongation of the rhizome), rigidly erect or spreading, of stiff, elastic texture, the tissue dark green and hygroscopic; stipes mostly 5–15 cm. long, wiry, flexuous, deciduously brown-hairy. Blades narrowly ovate to deltate, 8–20 cm. long, 4–15 cm. broad, acuminate, finely 3- to 4-pinnate (or small forms

2-pinnate-pinnatifid), the vascular parts more or less glandular-setulose beneath; rhachis terete, not winged but very narrowly 2-marginate above, bearing a few scattered hairs like those of the stipe; pinnae close, usually inequilateral at the base and acuminate at the apex, the divisions narrowly linear; ultimate segments very numerous, mostly 0.3–0.5 mm. broad, simple or forked, often revolute in drying. Sori numerous, subaxillary, reflexed; involucres narrowly funnel-shaped, somewhat compressed and narrowly marginate, the apex truncate and slightly 2-lobed; receptacle becoming very long-exserted.

General Distribution: Greater Antilles, continental tropical America from Guatemala to Bolivia and Brazil. Similar forms are widespread in the Old World tropics and subtropics.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, "reported from Barbados" (Maxon, 1926).

Habitat: Terrestrial; chiefly in moist, deeply shaded clay soils in rain forest areas at middle to higher elevations.

4. **Trichomanes elegans** L. C. Rich. in Act. Soc. Hist. Nat. Paris 1: 114. 1792.

Type: *Leblond*, from French Guiana.
Syn.: *Trichomanes prieurei* Kunze, Anal. Pter. 48. 1837.
Trichomanes anceps Hook., Sp. Fil. 1: 135, *t. 40-c.* 1846, in part and excl. *β*. (Syntypes from Guiana, Brazil, and Dominica.)
Trichomanes leprieurii Hook., Gard. Ferns *t. 11.* 1862.
Davalliopsis elegans (L. C. Rich.) Copel. in Philip. J. Sci. 67: 82. 1938.

Rhizome woody, decumbent to erect, bearing numerous tough, wiry prop roots, and clothed at the apex with stiff brown hairs. Fronds clustered, erect, elastic, with very dark green or blue-green, nearly opaque, stiff-textured, hygroscopic tissue; stipes 10–34 cm. long, very thick and wiry, often shallowly grooved, blackish-green, clothed especially toward the base with deciduous brown hairs. Blades narrowly to broadly deltate, 15–35 cm. long or more, up to 30 cm. broad at base, acuminate at the apex, usually 3- to 4-pinnate (or small forms 2-pinnate-pinnatifid), the vascular parts beneath minutely scurfy-glandular and with a few scattered hairs, otherwise glabrous; rhachis dull greenish, narrowly winged especially above by the decurrent bases of the pinnae; pinnae close, spreading, narrowly deltate to oblong, acuminate, the costae winged; ultimate divisions very numerous, linear, mostly 0.3–1 mm. broad, entire or serrulate toward the apex, with tips truncate or minutely forked; tissue several cells in thickness. Sori numerous, subaxillary, stalked, reflexed; involucres narrowly funnel-shaped, compressed and strongly marginate, with abruptly flaring truncate mouth (not bilobed).

General Distribution: Trinidad, Cocos Island, continental tropical America from Nicaragua to Peru and Brazil.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: Terrestrial in rain forests at lower to middle elevations.

Subgenus DIDYMOGLOSSUM

Key to the Species

- a. Venation flabellate (branching or radiating chiefly from one point at base of blade, a distinct costa (midvein) lacking or at least not extending beyond the middle).
  - b. Margin of frond bearing numerous minute scales; fronds 2–6(–14) cm. long, often irregular or deeply lacerate .... 5. *T. membranaceum*
  - b. Margin of frond without scales (but usually with hairs); fronds mostly 0.5–1.5(–2) cm. long.
    - c. Veins numerous, close, and subparallel; marginal hairs stellate.
      - d. Veins relatively thick, mostly enlarged toward the truncate apex at the frond margin .... 6. *T. lineolatum*
      - d. Veins delicate, not enlarged toward the apex .... 7. *T. punctatum*
    - c. Veins relatively few, these widely forked and divergent; marginal hairs simple or forked .... 8. *T. hymenoides*
- a. Venation pinnate (in larger species the frond dissection likewise pinnate); blades of small forms costate beyond the middle (costa usually extending to the apex).
  - e. Fronds simple, the margins merely sinuate or lobed.
    - f. Involucre protruding beyond the frond margin (at most narrowly winged), at apex bearing 2 roundish dark-marginate lips; veins wholly free to the margin (a transverse submarginal veinlet absent).
      - g. Lobes of frond usually 1-veined, the vein simple, forked, or few-branched; false veins few .... 8. *T. hymenoides*
      - g. Lobes of frond costate, but also with numerous oblique subparallel false veins (a similar vein pattern also in narrow unlobed fronds) .... 9. *T. angustifrons*
    - f. Involucre wholly immersed in the tissue, the lips not dark-marginate; veins transversely joined by a delicate veinlet along the margin .... 10. *T. kapplerianum*
  - e. Fronds pinnatifid or pinnately dissected, most of the ultimate lobes with unbranched costa and 1 or 2 false veins .... 11. *T. krausii*

5. **Trichomanes membranaceum** L., Sp. Pl. 2: 1097. 1753.

Type: linn *1253.1*, from "America," without exact locality. Linnaeus also cited Sloane and Plumier references pertaining to material from Jamaica and Hispaniola.

Syn.: *Lecanium membranaceum* (L.) C. Presl in Abh. Böhm. Ges. Wiss. V, 3: 104, *t. 1.* 1843.
Hemiphlebium membranaceum (L.) Prantl, Hymen. 46. 1875.

Plants colonial, often forming dense mats. Rhizome filiform, densely clothed with dark brown, hairlike rhizoids. Fronds distantly attached (but overlapping in mass), dark green, pellucid, subsessile. Blades extremely variable, roundish to cuneate-oblong, linear, or irregularly obovate, often coarsely cleft, the margin subentire to deeply lacerate-toothed, the veins numerous, close, repeatedly forked, the tissue between containing slender, elongate, unconnected false veins, these bearing at the marginal end opposing pairs of minute roundish scales which are deciduous with age. Sori when present mostly apical; involucre immersed, narrowly cylindric, terminating in abruptly flaring free lips.

General distribution: Greater Antilles, Tobago, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On wet shaded rocks or tree trunks at middle elevations.

6. **Trichomanes lineolatum** (van den Bosch) Hook. in Hook. & Baker, Syn. Fil. 73. 1867.

Basionym: *Didymoglossum lineolatum* van den Bosch in Nederl. Kruidk. Arch. **5**(3): 136. 1863.
Lectotype: *March 133*, from Jamaica, as selected by Wessels Boer in Acta Bot. Neerl. **11:** 304, 305. 1962.

Plants colonial, forming mats. Rhizome filiform, covered with minute, blackish, hairlike rhizoids. Fronds numerous, stiff, dull green, finely corrugate, stalked; stipes often as long as the blades, densely hairy like the rhizome. Blades variable, the smallest roundish and subsessile, the larger obovate to broadly cuneiform, mostly 1–2 cm. long, 0.8–1.5 cm. broad, rounded or truncate at the apex, long-cuneate at the base, irregularly lobed or lacerate, the venation very close and oblique, repeatedly forked. Sori few (1–5 per frond), solitary on short apical lobes; involucres immersed to the lips, these rounded and dark-marginate.

General Distribution: Florida, Greater Antilles, Venezuela, Brazil.

Distribution in Lesser Antilles: St. Vincent, *Guilding* (k).

Habitat: On wet rocks and tree trunks at low to middle elevations; plants very rare. The occurrence of this species in the Lesser Antilles needs further confirmation.

7. **Trichomanes punctatum** Poiret in Lam., Encycl. Méth. Bot. **8:** 64. 1808.

Type: Collector not stated, ex *Herb. Lamarck*, from Martinique (p).
Syn.: *Didymoglossum punctatum* (Poiret) Desvaux in Mém. Soc. Linn. Paris **6:** 330. 1827.
Trichomanes reptans sensu Hook. & Grev., Ic. Fil. *t. 32.* 1828, not Sw., 1788. (Material cited from St. Vincent.)
Didymoglossum hookeri C. Presl, Hymen. 23. 1844, not *Trichomanes hookeri* C. Presl, Hymen. 16. 1844. (Type from St. Vincent.)

Didymoglossum laceratum Fée, Mém. Fam. Foug. **11:** 113, *t. 32, fig. 1.* 1866. (Type from Guadeloupe.)

Hemiphlebium punctatum (Poiret) Prantl, Hymen. 46, *t. 2, fig. 18.* 1875.

Plants colonial, often forming thin mats. Rhizome filiform, densely clothed with minute, brown, hairlike rhizoids. Fronds numerous, variable, sessile or short-stipitate, with membranous tissue and numerous marginal stellate hairs, and with veins several times forked, the stronger ones running to the sori. Sterile blades chiefly roundish to reniform, 0.5–1 cm. long, nearly entire, or sometimes larger and coarsely lobed. Fertile blades 1–1.5(–2) cm. long, narrowly or broadly obovate, cuneate at base, at apex irregularly lobed or coarsely crenate-dentate. Sori solitary in a deep sinus, or else a few terminating apical lobes; involucre exserted and narrowly winged (the wings bearing stellate hairs), the lips dark-marginate.

General Distribution: Puerto Rico, Tobago, Trinidad, Venezuela. This range applies to subsp. *punctatum*, the only variant of this species found in the Lesser Antilles. Other subspecies occur in Florida, the Greater Antilles, and continental tropical America.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On shaded rocks and tree trunks at chiefly middle elevations.

8. Trichomanes hymenoides Hedwig, Fil. Gen. & Sp. *t. 3, fig. 3.* 1799.

Type: Hedwig, *t. 3, fig. 3,* based on material from an unknown locality.

Syn.: *Trichomanes muscoides* Sw. in J. Bot. Schrader **1800**(2): 95. 1801; Fl. Ind. Occ. **3:** 1726. 1806. (Type from Jamaica.)

Didymoglossum muscoides (Sw.) Desvaux in Mém. Soc. Linn. Paris **6:** 330. 1827.

Didymoglossum hymenoides (Hedwig) Desvaux in Mém. Soc. Linn. Paris **6:** 330. 1827.

Trichomanes apodum Hook. & Grev., Ic. Fil. **1:** *t. 117.* 1828. (Type from Barbados.)

Hemiphlebium hymenoides (Hedwig) Prantl, Hymen. 46. 1875.

Trichomanes fraseri Jenman in Gard. Chron. III, **20:** 266. 1896. (Type from Grenada.)

Plants colonial, forming mats. Rhizome filiform, clothed with minute, blackish-brown, hairlike rhizoids. Fronds extremely variable, even on the same plant, nearly sessile or with stipes 2–6 mm. long. Blades mostly 0.5–1.3 cm. long, oblong to roundish or reniform, the base cuneate, rounded, or cordate, the margins more or less regularly lobed or pinnatifid with marginal hairs dark brown, short, stiffly recurved, mostly forked at the base, the veins few, subflabellate but with a distinct percurrent costa to the apex, the side veins alternate, pinnately branched, the tissue between with a few delicate false veins. Sori few (1–6 per frond), chiefly on apical lobes; involucre free or slightly immersed at the base, urceolate, with short, rounded lips.

General Distribution: Greater Antilles except Puerto Rico; continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, Barbados.

Habitat: On rocks and tree trunks in deep shade, chiefly at middle elevations.

9. **Trichomanes angustifrons** (Fée) Wessels Boer in Kramer, Fl. Neth. Ant. 1(Pterid.): 17. 1962.

Basionym: *Didymoglossum angustifrons* Fée, Mém. Fam. Foug. **11**: 113, *t. 28, fig. 5.* 1866.

Type: *L'Herminier*, from Guadeloupe. The actual type specimen may no longer be extant, in which case Fée's *t. 28, fig. 5* can serve as lectotype.

Syn.: *Trichomanes pusillum* sensu Griseb., Fl. Br. W. Ind. 656. 1864; Jenman in Bull. Bot. Dept. Jamaica **20**: 7. 1890, and Ferns Br. W. Ind. & Guiana 20. 1898; Duss, Foug. & Lyc. Antill. Franc. 12. 1903, not Sw., 1788.
Trichomanes setiferum Baker ex Jenman in J. Bot. **19**: 52. 1881. (Type from Jamaica.)

Plants colonial, forming mats. Rhizome capillary, covered with minute, brown, hairlike rhizoids. Fronds numerous, overlapping, very variable, short-stipitate, mostly 0.5–1.5 cm. long. Blades often linear or linear-oblong, entire or nearly so and wider above the middle, or else in most fertile fronds and well developed sterile ones the blades narrowly cuneiform and 3-forked at the apex, to irregularly obovate and coarsely pinnatifid, the lobes few, oblique, linear-oblong and 3–6 mm. long, the tissue with numerous subparallel false veins, the margin bearing a few stellate hairs. Sori solitary on apical lobes; involucre immersed (often appearing merely narrowly winged), the lips relatively large, rounded, with dark margins of not more than one row of dark cells.

General Distribution: Greater Antilles, continental tropical America.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On rocks and trees in moist forest, at chiefly middle elevations.

10. **Trichomanes kapplerianum** Sturm in Mart., Fl. Bras. 1(2): 276. 1859.

Type: *Kappler 1760*, from Surinam (w).
Syn.: *Didymoglossum cordifolium* Fée, Mém. Fam. Foug. **11**: 113, *t. 28, fig. 4.* 1866. (Type from Martinique.)
Hemiphlebium kapplerianum (Sturm) Prantl, Hymen. 46. 1875.
Trichomanes muscoides var. *cordifolium* (Fée) Jenman in Bull. Bot. Dept. Jamaica **20**: 8. 1890; Ferns Br. W. Ind. & Guiana 22. 1898.
Trichomanes muscoides var. *minor* Jenman in Bull. Bot. Dept. Jamaica **20**: 8. 1890; Ferns Br. W. Ind. & Guiana 22. 1898.
Trichomanes hookeri var. *cordifolium* (Fée) Bonaparte, Notes Pter. 7: 337. 1918.
Trichomanes hookeri var. *minor* (Jenman) Domin, Pter. Dominica 47. 1929.
Trichomanes cordifolium (Fée) Alston in Kew Bull. **1932**: 306. 1932.

Plants colonial, forming mats. Rhizome filiform, clothed with minute, brown, hairlike rhizoids. Fronds numerous, densely overlapping, 0.5–2 cm. long, the tissue light green, delicate and translucent; stipes very short or lacking. Blades variable, the young ones often circular or cordate, the mature ones ovate to oblong, the base acute, rounded, or cordate, the apex rounded or with small lobes in which the sori are immersed, the margin otherwise indistinctly or not at all lobed; midvein distinct, pinnately branched, the branches 1- to 2-forked, the upper ones flabellate, all veins excurrent to a delicate, discontinuous marginal veinlet; tissue with a few delicate false veins, those near the margin deflexed into the marginal veinlet. Sori 1–7; involucre cylindric, immersed, with abruptly flaring green lips.

General Distribution: Greater Antilles, Trinidad, northern South America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On tree trunks and moist shaded rocks at lower to middle elevations.

This species is often confused with the closely related *T. hookeri* of the Greater Antilles.

11. **Trichomanes krausii** Hook. & Grev., Ic. Fil. 2: *t. 149*. 1831.

Type: *Kraus*, from Dominica (E).
Syn.: *Didymoglossum krausii* (Hook. & Grev.) C. Presl, Hymen. 23. 1844.
Didymoglossum fructuosum Fée, Mém. Fam. Foug. **11**: 112, *t. 28, fig. 3.* 1866. (Type from Guadeloupe.)
Hemiphlebium krausii (Hook. & Grev.) van den Bosch ex Prantl, Hymen. 46. 1875.

Plants colonial, forming mats. Rhizome slender, densely clothed with minute, blackish, hairlike rhizoids. Fronds short-stipitate (stipe and lower rhachis radiculose like the rhizome), 2–4(–9) cm. long, 1–2.5 cm. broad near the middle. Blades variable, broadly oblong to lance-oblong, deeply pinnatifid to bipinnatifid with winged rhachis; segments linear, unequal, separated by broad, open sinuses with a large stellate hair on a tooth at the bottom, the margins otherwise with simple or forked hairs. Sori several, solitary at the ends of apical or upper segments; involucre partly immersed or winged, with suborbicular dark-marginate lips.

GENERAL DISTRIBUTION: Florida, Greater Antilles, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Epiphytic or sometimes on wet shaded rocks at lower to middle elevations.

Subgenus ACHOMANES

KEY TO THE SPECIES

a. Veins joined by delicate transverse veinlets in the tissue; frond apex often flagellate, with elongate naked tips frequently rooting . . . . 12. *T. pinnatum*
a. Veins wholly free, lacking transverse veinlets in the tissue; fronds never with flagellate, naked apex.
  b. Rhizomes elongate, more or less wide-creeping, the fronds scattered or close but not fasciculate.
    c. Fronds sessile or nearly so; blades 2- or 3-pinnatifid, with glabrous margins . . . . 13. *T. pedicellatum*
    c. Fronds distinctly stipitate; blades pinnatifid to 1-pinnate, with ciliate margins.
      d. Rhizomes subwoody, cordlike, 1–2 mm. in diameter.
        e. Marginal hairs simple; stipes unwinged . . . . 14. *T. robustum*
        e. Marginal hairs forked or stellate; stipes broadly winged . . . . 15. *T. trigonum*
      d. Rhizomes filiform, 0.5 mm. in diameter; stipes relatively short, winged toward the apex . . . . 16. *T. polypodioides*
  b. Rhizomes short, erect, the fronds fasciculate.
    f. Fertile and sterile fronds alike, not dimorphic; roots 0.3–0.5 mm. in diameter.
      g. Stipes winged.
        h. Blades pinnatifid, glabrous at least on the margins . . . . 17. *T. holopterum*
        h. Blades bipinnatifid, clothed with stellate hairs . . 18. *T. alatum*
      g. Stipes unwinged.
        i. Pinnae entire or nearly so; involucre slightly flaring at apex, not over 1 mm. wide . . . . 19. *T. crispum*
        i. Pinnae lobed or pinnatifid; involucre broadly flaring at apex, up to 2 mm. wide . . . . 20. *T. crinitum*
    f. Fronds dimorphic, the fertile ones much contracted; roots stiff and wiry, 0.5–1 mm. in diameter . . . . 21. *T. osmundoides*

12. Trichomanes pinnatum Hedwig, Fil. Gen. & Sp. *t. 4, fig. 1.* 1799.

Lectotype: Hedwig, *t. 4, fig. 1,* based on material allegedly from Jamaica. No one has since found this species on that island.

Syn.: *Trichomanes rhizophyllum* Cav., Descr. Pl. 279. 1802. This name was not published as a proper binomial, but is usually accepted as such probably because the index (p. 624) lists the generic name plus the first word ("rhizophylla") of the polynomial phrase name, so that it appears to be a specific epithet in the modern sense. It can be noted that Cavanilles used proper binomial nomenclature in other publications.

Trichomanes floribundum Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5:** 505. 1810. (This was a renaming of *T. pinnatum.*)

Trichomanes pennatum Kaulf., Enum. Fil. 264. 1824.

Neurophyllum pennatum (Kaulf.) C. Presl, Hymen. 19. 1844.

Neurophyllum pinnatum (Hedwig) C. Presl, Hymen. 19. 1844.

Neuromanes kaulfussii van den Bosch in Nederl. Kruidk. Arch. **4:** 348. 1859.

Neuromanes hedwigii van den Bosch in Nederl. Kruidk. Arch. **4:** 348. 1859.

Neuromanes immersum van den Bosch in Nederl. Kruidk. Arch. **4:** 349. 1859.

Neurophyllum hedwigii (van den Bosch) Fée, Mém. Fam. Foug. **11:** 104. 1866.

Neurophyllum thecaphyllum Fée, Mém. Fam. Foug. **11:** 104, *t. 28, fig. 1.* 1866.

Neurophyllum rhizophyllum (Cav.) Fée, Mém. Fam. Foug. **11:** 105. 1866. (Cited from Guadeloupe.)

Trichomanes pinnatum var. *floribundum* (Humb. & Bonpl. ex Willd.) Jenman, Ferns Br. W. Ind. & Guiana 23. 1898.

Trichomanes pinnatum var. *hedwigii* (van den Bosch) Domin, Pter. Dominica 54. 1929.

Trichomanes pinnatum var. *hedwigii* f. *stipitatum* Domin, Pter. Dominica 55. 1929.

Trichomanes pinnatum var. *hedwigii* f. *immersum* (van den Bosch) Domin, Pter. Dominica 55. 1929.

Trichomanes pinnatum var. *hedwigii* subvar. *rhizophyllum* (Cav.) Domin, Pter. Dominica 55. 1929.

Trichomanes pinnatum var. *kaulfussii* (van den Bosch) Domin, Pter. Dominica 55. 1929.

Rhizome short-creeping or curved-ascending, woody, bearing wiry prop roots, and clothed at the apex with lustrous brown hairs. Fronds clustered, slightly dimorphic, with translucent, firmly membranous tissue. Sterile fronds short-stipitate, the blades spreading or recurved, each usually terminating in a naked, flagelliform tip producing alternate proliferous buds along the sides. Fertile fronds erect; stipes mostly 10–30 cm. long, very narrowly green-winged above, glabrous or with a few deciduous brown hairs. Blades 10–25 cm. long, 6–25 cm. broad, deltate-oblong or oblong to ovate (excluding the elongate terminal pinna), pinnate at base, pinnatisect above; rhachis narrowly winged, sparsely hairy or glabrate; pinnae 3–10 on a side, these ligulate-oblong, 4–13 cm. long, 0.8–2 cm. broad, the lower ones free and sessile or short-stalked, the upper ones adnate or decurrent; with numerous close, simple or 1- or 2-forked veins, united at the tips by a marginal vein. Sori numerous on both margins; involucres sessile or short-stalked, with cartilaginous margins and slightly bilobed mouth.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Shaded earth banks at lower to middle elevations.

Recent studies by Bierhorst (Amer. J. Bot. 62(5): 448–456. 1975) indicate that this species has an apogamous life cycle.

13. **Trichomanes pedicellatum** Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 328. 1811.

Type: Collector not stated, ex *Herb. Desvaux*, from Cayenne (P).
Syn.: *Trichomanes brachypus* Kunze in Linnaea **9**: 105. 1834. (This was a renaming of *T. radicans* Hook. & Grev., 1831, not Sw., 1801.)

Rhizome elongate, scandent on tree trunks, ca. 1 mm. in diameter or a little more, bearing hairlike rhizoids in a line on one side, the internodes 1–2 cm. long, and at the lowermost end bearing a cluster of wiry black roots. Fronds spreading. Blades nearly sessile, oblong to ovate, 5–10(–15) cm. long, 2–6 cm. broad, mostly 3-pinnatifid, the linear ultimate segments ca. 1 mm. broad; tissue membranous, glabrous, with veins bearing minute, appressed, brown, 2- or 3-celled hairs, especially beneath. Sori terminating segments toward the base of secondary divisions, ca. 2 mm. long, stalked; involucre cylindric, the mouth not dilated.

General Distribution: Trinidad, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, *L'Herminier* (P); St. Vincent (cited by Hooker & Greville, 1831, on the basis of a specimen collected by Guilding, and cited again by Rolfe, 1893, as *T. brachypus*).

Habitat: Moist primary forest at lower elevations; plants very rare, not found since the mid-nineteenth century.

This species may be extinct in the Lesser Antilles due to cutting of the forests at lower elevations.

14. **Trichomanes robustum** Fourn. in Bull. Soc. Bot. France **15**: 147. 1868.

Type: *L'Herminier in 1842*, from Guadeloupe.
Syn.: *Trichomanes crispum* sensu Hook. & Grev., Ic. Fil. **1**: *t. 12.* 1828, not L., 1753. (Cited from St. Vincent.)
Trichomanes accedens sensu Fée, Mém. Fam. Foug. **11**: 105. 1866, ? not

C. Presl, 1849. (Cited by Fée from Guadeloupe, Martinique, and Hispaniola.)

? *Trichomanes procerum* Fée, Mém. Fam. Foug. **11**: 106, *t. 28, fig. 2.* 1866. (Type found "in Antillis.") This name has priority over the one accepted for this species, but Fée's plate shows a plant that differs markedly in the shape of the blade, being long-decrescent below and having a very short stipe. I have not seen a specimen looking like this from the Lesser Antilles, but one was reported by Domin in 1929.

Trichomanes crispum var. *pellucens* sensu Jenman, Ferns Br. W. Ind. & Guiana 26. 1898, not *T. pellucens* Kunze, 1834.

? *Trichomanes crispum* var. *procerum* (Fée) Jenman, Ferns Br. W. Ind. & Guiana 26. 1898.

? *Trichomanes accedens* var. *procerum* (Fée) Domin, Pter. Dominica 53. 1929. (Cited from Guadeloupe, based on a specimen collected by L'Herminier.)

Rhizome elongate, cordlike, densely clothed with stiff, lustrous dark brown hairs. Fronds distant, stiffly erect, the tissue firmly membranous, pellucid; stipes mostly 4.5–9 cm. long, not winged, clothed with spreading, flexuous brown hairs, especially near the base. Blades oblong or lance-oblong, 9–19 cm. long, 2.5–6 cm. broad, acute to acuminate at the apex, truncate at base; pinnae oblong-ligulate, mostly 4–9 mm. broad, rounded at the apex, the lower ones constricted at the base, the margins subentire or minutely sinuate, distantly ciliate, the hairs arising from a basal, brown, glandular cell, the surfaces of the blade glabrate. Sori glabrous or nearly so; involucre narrowly urceolate, ca. 2 mm. long.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad (?), Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent.

HABITAT: On mossy logs in wet montane woodlands at high elevations.

15. **Trichomanes trigonum** Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 328. 1811.

Type: Collector not stated, ex *Herb. Desvaux*, from "Gallia aequinoctiali," perhaps French Guiana.

Syn.: *Trichomanes lucens* sensu Hook. & Grev., Ic. Fil. **1**: *t. 10.* 1827, not Sw., 1788. (Cited from St. Vincent and British Guiana.)

Trichomanes kaulfussii Hook. & Grev., Ic. Fil. Addenda. 1831. (Syntypes from Martinique, St. Vincent, and British Guiana.)

Ptilophyllum kaulfussii (Hook. & Grev.) Prantl, Hymen. 48. 1875.

Rhizome woody, cordlike, giving forth numerous wiry roots, the growing end densely clothed with septate, yellow-brown hairs. Fronds erect, close or somewhat distant, clothed throughout with scattered simple, geminate, and stellate hairs, the tissue firmly membranous and translucent; stipes 5–19 cm. long, winged especially in the upper half. Blades linear-oblong to oblong-lanceolate or narrowly elliptic, 10–30 cm. long, 4–8 cm. broad at or below the middle, truncate or very slightly reduced at base, acuminate to somewhat acute at the apex, pinnatifid to the broadly winged rhachis (wings to 2 mm. broad on each side); segments linear-oblong, 5–10 mm. broad, pinnately veined. Sori up to 6 on either side of fertile segments; involucre immersed except for the more or less abruptly flaring truncate mouth (rarely somewhat exserted).

Two rather distinctive variants occur in the Lesser Antilles; these can be distinguished as follows:

a. Margins of pinnae sinuate-crenulate; involucres distinctly flaring at the mouth .... 15a. var. *trigonum*
a. Margins of pinnae deeply fimbriate-lacerate, the capillary ends of the lacerations gland-tipped; involucres not at all flaring at the mouth .... 15b. var. *fimbriatum*

15a. Trichomanes trigonum var. trigonum

General Distribution: Trinidad, South America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Terrestrial in moist shaded humus or on rotten logs, the rhizomes embedded in moss, at chiefly high elevations.

15b. Trichomanes trigonum var. fimbriatum (Backh.) Proctor in Rhodora 63: 31. 1961.

Basionym: *Trichomanes fimbriatum* Backh., Cat. 12. 1861; Backh. in Gard. Chron. **1862:** 44. 1862.

Type: A cultivated specimen from "the collection of J. Day, Esq., of Tottenham" which probably originated in Trinidad.

Syn.: *Trichomanes superbum* van den Bosch in Nederl. Kruidk. Arch. **5:** 203. 1863, not Backh., 1862.

General Distribution: Tobago, Trinidad, Surinam (?). (Most Surinam specimens identified as this represent a different variant of *T. trigonum.*)

Distribution in Lesser Antilles: Grenada.

Habitat: Same as for var. *trigonum*; in Grenada these two varieties grow mixed together.

16. Trichomanes polypodioides L., Sp. Pl. 2: 1098. 1753.

Type: Unknown. There is no specimen labelled "polypodioides" in the Linnaean Herbarium, nor did Linnaeus cite any collateral reference; he merely gave a diagnosis, stated that his species came from "India," and then added further descriptive notes. However, the species as now understood occurs only in the American tropics.

As a further complication, the specimen labelled *Trichomanes crispum* by Linnaeus in his herbarium is in fact the plant we are now calling *polypodioides*, but of course it may have been a later insertion, perhaps misidentified by Linnaeus himself. Fortunately, the name *crispum* can be typified otherwise, but for *polypodioides* we have only the original diagnosis. For this reason, I designate *Proctor 19068*, from Montserrat (A), as neotype in order to stabilize the application of the name *T. polypodioides*.

Syn.: *Trichomanes sinuosum* Rich. ex Willd. in L., Sp. Pl. 5: 502. 1810. (Type from Guadeloupe.)
Ptilophyllum sinuosum (Rich. ex Willd.) Prantl, Hymen. 47. 1875.

Rhizome filiform, loosely clothed with yellowish-brown, hairlike rhizoids. Fronds distant, pendent, 5–15(–25) cm. long, short-stipitate; stipes mostly 0.5–1.5 cm. long, abruptly broad-winged toward the apex. Blades linear to oblong or linear-lanceolate, 1–3.5 cm. broad, coarsely sinuate-lobate to deeply pinnatifid, decurrent at base, the tissue pale green, membranous, glabrous and translucent; segments oblique, mostly oblong, 3–7 mm. broad, pinnately veined, the more or less sinuate margins sparsely beset with forked or stellate, yellow-brown hairs similar to those of stipe and rhachis. Sori mostly solitary at the ends of middle and upper segments, immersed; involucre broadly expanded at the truncate apex.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Epiphytic in moist forests at chiefly middle elevations, most often occurring on the trunks of tree-ferns.

17. **Trichomanes holopterum** Kunze, Farrnkr. 1: 185, *t. 77, fig. 2.* 1845.

Type: *Bory de St. Vincent, Trichom. no. 40*, from Guadeloupe. The holotype specimen in Kunze's herbarium at Leipzig must have been destroyed during the last World War; so far as I know, no suitable duplicate material has been located in some other herbarium for lectotypification. For this reason, I designate Kunze's *t. 77, fig. 2* (cited above) as lectotype.

Syn.: *Trichomanes bancroftii* sensu Griseb., Fl. Br. W. Ind. 655. 1864, not Hook. & Grev., 1831.
Ptilophyllum holopterum (Kunze) Prantl, Hymen. 47. 1875.

Rhizome erect, bearing numerous slender, wiry roots, the apex clothed with stiff, blackish-brown hairs. Fronds fasciculate, erect, the tissue dark yellowish-green, stiff, translucent, sparingly pubescent on the vascular parts; stipes 1.5–5 cm. long, broadly winged. Blades oblong or lance-oblong, 3–8 cm. long, 1.5–3 cm. broad, rounded-obtuse at the apex, pinnatifid; rhachis broadly winged (wings to 2 mm. wide on either side); segments 5–10 on a side, close, oblong to broadly oblong, rounded at the apex, coarsely sinuate-lobulate. Sori numerous, usually several at the apex of middle and upper segments; involucres urceolate and wholly immersed.

GENERAL DISTRIBUTION: Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

HABITAT: Usually on mossy rotten logs and stumps in moist forested areas at chiefly middle elevations.

18. **Trichomanes alatum** Sw. in J. Bot. Schrader **1800**(2): 97. 1801.

Type: *Swartz*, from Jamaica. Swartz also cited Plumier, Tr. Foug. *t. 50, fig. D.*

Syn.: *Trichomanes attenuatum* Hook., Sp. Fil. **1**: 122, *t. 39-c.* 1844. (Syntypes from St. Vincent, Jamaica, and Dominica.)
Trichomanes ptilodes van den Bosch in Nederl. Kruidk. Arch. **4**: 357. 1859. (Syntypes from Jamaica, Guadeloupe, and Venezuela.)
Ptilophyllum attenuatum (Hook.) van den Bosch ex Prantl, Hymen. 48. 1875.
Ptilophyllum ptilodes (van den Bosch) van den Bosch ex Prantl, Hymen. 48. 1875.
Trichomanes alatum subsp. *eualatum* Domin, Pter. Dominica 50. 1929.
Trichomanes alatum var. *svartzianum* Domin, Pter. Dominica 50. 1929.
Trichomanes alatum var. *ptilodes* (van den Bosch) Domin, Pter. Dominica 50. 1929.
Trichomanes alatum subvar. *margaritae* Domin, Pter. Dominica. 50, 51. 1929.
Trichomanes alatum subvar. *latealatum* Domin, Pter. Dominica. 51. 1929.
Trichomanes alatum var. *attenuatum* (Hook.) Domin, Pter. Dominica 51. 1929.
Trichomanes alatum var. *depauperatum* Domin, Pter. Dominica 51. 1929.

Rhizome small, oblique or erect, densely clothed toward the apex with stiff yellowish-brown hairs. Fronds fasciculate, ascending, the tissue yellowish-green, delicately membranous and translucent, clothed throughout on vascular parts and margins with lax, forked hairs, these mostly deciduous with age; stipes 1.5–12 cm. long, more or less winged above. Blades lance-oblong to ovate-lanceolate, 5–25 cm. long, 2–7 cm. broad, acuminate to attenuate at the apex, bipinnatifid, or else pinnatifid with lobed segments; primary rhachis narrowly winged; primary segments oblique, oblong-acuminate to lance-attenuate, lobed or pinnatifid, pinnately veined. Sori solitary, terminating the larger secondary segments or lobes in the upper part of the frond; involucre short, immersed, urceolate with flaring truncate mouth.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, Margarita Island.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Usually on shaded trunks of trees or tree-ferns, sometimes on moist boulders in deep shade, at chiefly middle elevations.

The Lesser Antillean plants tend to be much larger than the majority of specimens from the Greater Antilles, but not consistently so; it seems doubtful that the two populations can be separable as varieties.

19. **Trichomanes crispum** L., Sp. Pl. 2: 1097. 1753.

Lectotype: Plumier, Tr. Foug. *t. 86*, based on material from Morne de la Calabasse, Martinique. The specimen marked *T. crispum* in Linnaean Herbarium is *T. polypodioides* as that species is currently understood, but there is nothing to indicate whether this particular specimen was in the hands of Linnaeus in 1753. Since Linnaeus himself attributes his *T. crispum* to Martinique (the Plumier locality), it seems probable that his concept was primarily if not wholly based on the Plumier plate cited above.

Syn.: *Trichomanes fastigiatum* Sieber ex C. Presl, Hymen. 15. 1844. (Type from Martinique.)
Trichomanes crispum β remotum Fée, Mém. Fam. Foug. **11**: 106. 1866. (Type from Guadeloupe.)
Trichomanes badium Fourn. in Bull. Soc. Bot. France **15**: 147. 1868. (Syntypes from Guadeloupe, Cuba, and Venezuela.)
Trichomanes molle Fourn. in Bull. Soc. Bot. France **15**: 147. 1868. (Syntypes from Guadeloupe and "Bahia.")
Ptilophyllum crispum (L.) Prantl, Hymen. 47. 1875.
Trichomanes crispum var. *fastigiatum* (Sieb. ex C. Presl) Hieron. in Engl. Bot. Jahrb. **34**: 422. 1904.

Rhizome short, decumbent to erect, ca. 4–5 mm. thick, densely clothed with stiff, lustrous dark brown hairs. Fronds fasciculate, mostly erect, the tissue firmly membranous, pellucid, often crispate; stipes 2–12 cm. long, not winged, clothed with spreading, flexuous, rusty hairs. Blades lance-oblong to narrowly deltate-lanceolate, 5–25 cm. long, 2.5–6 cm. broad, gradually reduced to the blunt apex, deeply pinnatifid; rhachis winged upwardly, rusty-hairy (as are the other vascular parts and margins); segments up to 25 or more on a side, spreading, close, or overlapping (more separated in var. *fastigiatum*), narrowly to broadly oblong, 5–10 mm. broad, the margins subentire, with oblique veins (veins of sterile fronds 1- to 3-forked). Sori apical on middle and upper segments, mostly 1–6 per segment; involucres cylindric, immersed, green, slightly flaring at the truncate mouth; receptacle becoming very long-exserted.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Guatemala to northern South America. There are many related forms in South America whose status has yet to be determined.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Usually growing in moss or humus on tree trunks, rotten logs, stumps, and shaded banks at chiefly middle elevations.

20. **Trichomanes crinitum** Sw., Prodr. 136. 1788; Fl. Ind. Occ. 3: 1730. 1806.

Type: *Swartz*, from Jamaica.
Syn.: *Ragatelus crinitus* (Sw.) C. Presl, Hymen. 17. 1844.
Trichomanes l'herminieri Fée, Mém. Fam. Foug. **11**: 107, *t. 29, fig. 1.* 1866. (Type from Guadeloupe.)
Trichomanes holopterum var. *l'herminieri* (Fée) Domin, Pter. Dominica 49. 1929.

Rhizome small, decumbent to erect, densely clothed at the apex with brown, turgid, septate hairs. Fronds fasciculate, lax or pendent, the tissue pale green and thinly membranous; stipes mostly 1–4(–7) cm. long, not winged, densely clothed (especially toward base) with rusty spreading hairs, these having a turgid, glandular basal cell. Blades linear, lance-linear, or linear-oblong, 4–22 cm. long, 1.5–2.5 cm. broad, blunt or truncate at the apex, pinnatifid (nearly pinnate toward base), the segments more or less adnate to the rhachis; rhachis winged above and bearing hairs like those of the stipe (similar hairs on the other vascular parts and margins); segments numerous, close or crowded, deltate to broadly oblong, coarsely sinuate-lobed with mostly 2–4 pairs of simple or forked lobes ca. 1 mm. broad. Sori on the apical lobes of middle and upper segments; involucres immersed, broadly urceolate with flaring, truncate mouth.

General Distribution: Jamaica, northern South America.

Distribution in Lesser Antilles: Guadeloupe, St. Vincent, Grenada.

Habitat: Usually on large mossy logs or in sheltered hollows of tree trunks or old stumps in moist forest, at middle to higher elevations; plants rare.

21. **Trichomanes osmundoides** DC. ex Poiret in Lam., Encycl. Méth. Bot. **8**: 65. 1808.

Type: Stated to be from "Amerique meridionale"; I have not been able to determine whether a specimen is extant. There is none in the Lamarck Herbarium.
Syn.: *Trichomanes spicatum* Hedwig ex Weber & Mohr, Beitr. **1**: 116. 1805, nomen nudum; Hook., Sp. Fil. **1**: 114. 1846. (Syntypes from Jamaica, Guadeloupe, St. Vincent, Trinidad, and Guyana.)
Trichomanes spicisorum Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 329, *t. 7, fig. 7.* 1811. (Type from "Gallia aequinoctiali.")
Feea polypodina Bory, Dict. Classique **6**: 446. 1824.
Feea spicata (Hedwig ex Hook.) C. Presl in Abh. Böhm. Ges. Wiss. **5**: 330. 1848.
Ptilophyllum spicatum (Hedwig ex Hook.) Prantl., Hymen. 49. 1875.

Feea osmundoides (DC. ex Poiret) Copel. in Philip. J. Sci. **67:** 74. 1938.

This species was well illustrated by Hooker, Garden Ferns *t. 60*, 1862, under the name *Trichomanes spicatum.*

Rhizome short to somewhat elongate, oblique or usually erect, supported by numerous tough, wiry prop roots, the apex clothed with dark brown hairs. Fronds closely fasciculate, dimorphic, the sterile ones foliaceous, recurved-spreading, the tissue firmly membranous, dark green and subpellucid, the fertile ones much contracted and stiffly erect; stipes wiry, not winged, sparsely clothed on one side with spreading brown hairs, stipes of sterile fronds 0.5–5 cm. long, those of fertile fronds 5–12 cm. long. Sterile blades lance-oblong, mostly 5–17 cm. long, 2–4 cm. broad, blunt or somewhat acute at the apex, deeply pinnatifid; rhachis broadly winged, bearing brown, crispate hairs beneath, glabrous above; segments numerous, close, narrowly oblong, ca. 2–4 mm. broad, rounded or blunt, the margins minutely sinuate, glabrous, the veins oblique, 1- to 2-forked, free, minutely crispate-hairy beneath. Fertile blades 4–12 cm. long, 0.3–0.5 cm. broad, linear, consisting of a marginate rhachis closely beset on either side with a row of sori. Sori numerous, stalked or subsessile; involucres urceolate, marginate or narrowly winged, not flaring at the truncate mouth; receptacle becoming very long-exserted.

General Distribution: Greater Antilles except Puerto Rico; Trinidad, continental tropical America from Costa Rica to northern South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Terrestrial, usually growing on moist, deeply shaded clay banks in rain forest, at chiefly middle elevations.

Family CYATHEACEAE

Medium-sized to very large ferns, mostly with a stout, erect, trunklike rhizome (caudex), or rarely the rhizome creeping or decumbent, clothed with hairs or scales, and often more or less spiny. Fronds usually very large, 1- to 4-pinnate, smooth or bearing spines on the stipes and sometimes on the rhachis and costae. Sori dorsal, round; indusium (if present) subtending and partially or entirely enclosing the sorus, but in many species absent or represented by a minute scale. Sporangia short-stalked, the stalk consisting of more than 3 rows of cells, borne on an elevated receptacle, and often accompanied by characteristic paraphyses; annulus oblique, not interrupted by the stalk; spores tetrahedral, smooth or irregularly ridged, or rarely faintly tuberculate or spinulose. Gametophytes green, cordate, flat, with multicellular, elongate, scalelike appendages.

A moderate-size family of about 650 species, variously grouped in four to eight genera, of pantropical distribution, being especially characteristic of cool, moist, tropical mountain climates. The dicksonioid ferns, characterized by marginal, purselike sori and hairy indument, which have been included in Cyatheaceae by Holttum (1963), are here considered to be a separate family.

The classification of tree-ferns has long been in an unsatisfactory state, and only in recent years has there been some improvement. In particular, the studies of Holttum (1963), and of R. Tryon (1970) and his students, have shed much light on the morphological relationships among these plants. In the present treatment, the major groupings proposed by Tryon have been accepted, but there does not seem to be sufficient evidence to separate them on a generic level. Consequently, they are treated as subgenera.

SPECIAL LITERATURE: Maxon, The tree-ferns of North America, in Smiths. Repp. **1911**: 463–491, *t. 1–12*. 1912; Copeland, Cyatheaceae, in Gen. Fil. 94–99. 1947; Holttum, Cyatheaceae, in Fl. Males. II, 1(*2*): 65–72. 1963; R. Tryon, The classification of the Cyatheaceae, in Contr. Gray Herb. **200**: 3–53. 1970; Gastony, A revision of the fern genus *Nephelea*, in Contr. Gray Herb. **203**: 81–148, *figs. 1–98*. 1973.

KEY TO THE GENERA

a. Caudex creeping, clothed with hairs but not scales; blades 1-pinnate with unlobed pinnae; sori 1 to several per vein; indusium entirely lacking .... 1. *Metaxya*

a. Caudex erect, trunklike, bearing scales at least at the apex; blades pinnate-pinnatifid to 2-pinnate-pinnatifid; sori always 1 per vein; indusium present or absent.

  b. Veins all free; blades 2-pinnate-pinnatifid; caudex becoming tall (up to about 15 m.) .... 2. *Cyathea*

  b. Basal veins joined, forming costal areoles; blades 1-pinnate-pinnatifid; caudex relatively short (mostly 0.5–1 m., rarely to 2 m. tall at maturity) .... 3. *Cnemidaria*

METAXYA Presl

Metaxya C. Presl, Tent. Pter. 59. 1836. FIGURE 13.

Syn.: *Amphidesmium* Schott, Gen. Fil. *ad t. 5*. 1834, nomen nudum; C. Presl, Tent. Pter. 246. 1836, nomen nudum.

A medium-sized terrestrial fern having a woody, solenostelic, creeping rhizome clothed with numerous soft, pluricellular hairs. Fronds distichous and long-stipitate. Blades 1-pinnate; pinnae simple, linear-oblong, glabrous or nearly so, with veins free, closely parallel, simple or rarely forked. Sori dorsal on veins, often several on the same vein, round, arising from a nearly flat receptacle; non-indusiate. Sporangia mixed with copious hairlike paraphyses; pedicel of sporangium short, consisting of 4 rows of cells; spores globose-tetrahedral, faintly tuberculate.

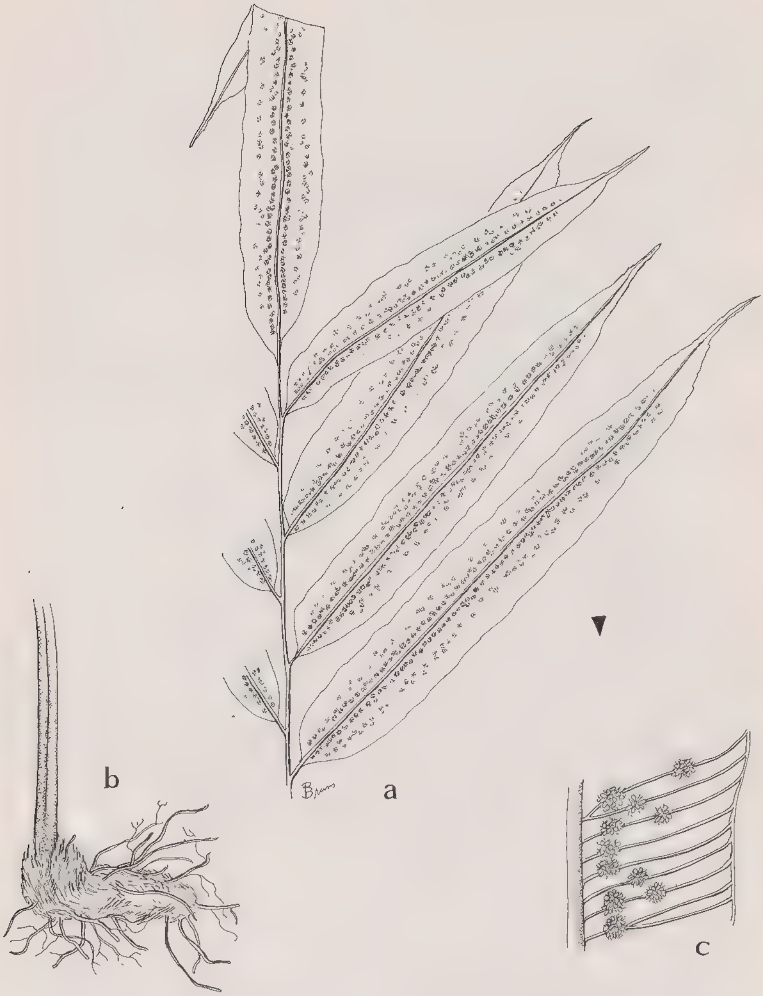

FIGURE 13. **Metaxya.** a–c, *M. rostrata*: a, portion of blade, × 0.4; b, rhizome, × 0.5; c, portion of pinna, showing venation and sori, × 3.0.

TYPE SPECIES: *Metaxya rostrata* (Kunth) C. Presl, based on *Aspidium rostratum* Kunth, of tropical America.

1. **Metaxya rostrata** (Kunth) C. Presl, Tent. Pter. 60. 1836.

Basionym: *Aspidium rostratum* Kunth in H. B. K., Nov. Gen. & Sp. 1: 12. 1815.

Type: *Humboldt 966, Herb. Willd. 19691,* from "crescit prope Javita in sylvis Orinocensibus," Venezuela (B).

Syn.: *Polypodium blechnoides* L. C. Rich. in Act. Soc. Nat. Hist. Paris 1: 114. 1792, nomen nudum; Sw., Syn. Fil. 73. 1806, nomen nudum.
Polypodium rostratum Humb. & Bonpl. ex Willd. in L., Sp. Pl. 5: 193. 1810, not Burm., 1768, nor Cav., 1802.
Polypodium humboldtii Poiret in Lam., Encycl. Méth. Bot. Suppl. 4: 497. 1816.
Polypodium parkeri Hook. & Grev., Ic. Fil. 2: *t. 232.* 1831. (Type from Guyana.)
Alsophila rostrata (Kunth) Mart., Ic. Pl. Bras. 64, *t. 39.* 1834.
Amphidesmium parkeri (Hook. & Grev.) C. Presl, Tent. Pter. 246. 1836, illegit.
Amphidesmium rostratum (Kunth) J. Smith in London J. Bot. 1: 201. 1842, illegit.
Metaxya parkeri (Hook. & Grev.) J. Smith in London J. Bot. 1: 668. 1842.
Alsophila blechnoides Hook., Sp. Fil. 1: 35. 1844.
Amphidesmium blechnoides (Hook.) Klotzsch in Linnaea 20: 372. 1847, illegit.
Cyathea blechnoides (Hook.) Domin, Pteridophyta 261. 1929.

Rhizome 8–15 mm. thick. Fronds mostly 1–1.5 m. long; stipes 50–70 cm. long, light brown and glabrate. Blades oblong-elliptic, to 30 cm. broad; pinnae alternate, oblique, up to 20 cm. long, 2–3 cm. broad, short-stalked, abruptly acuminate-subcaudate at the apex, the margins obliquely serrate, the tissue firmly papery. Sori forming a dense row on either side of the costa, others being scattered more irregularly but mostly inframedial, none occurring near the margins.

GENERAL DISTRIBUTION: Trinidad, continental tropical America from Belize to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *L'Herminier* (BM, P, photo IJ), and "*Herbier, A. Baudouin no. 182*" (P).

HABITAT: Moist forests at low elevations; plants very rare. This species may now be extinct in Guadeloupe due to destruction of its natural habitat.

CYATHEA Smith

Cyathea Smith in Mém. Acad. Turin 5: 416. 1793. FIGURE 14.

Caudex usually tall, treelike, dictyostelic, with a dense growth of adventitious roots toward the base, the apex clothed with scales. Fronds

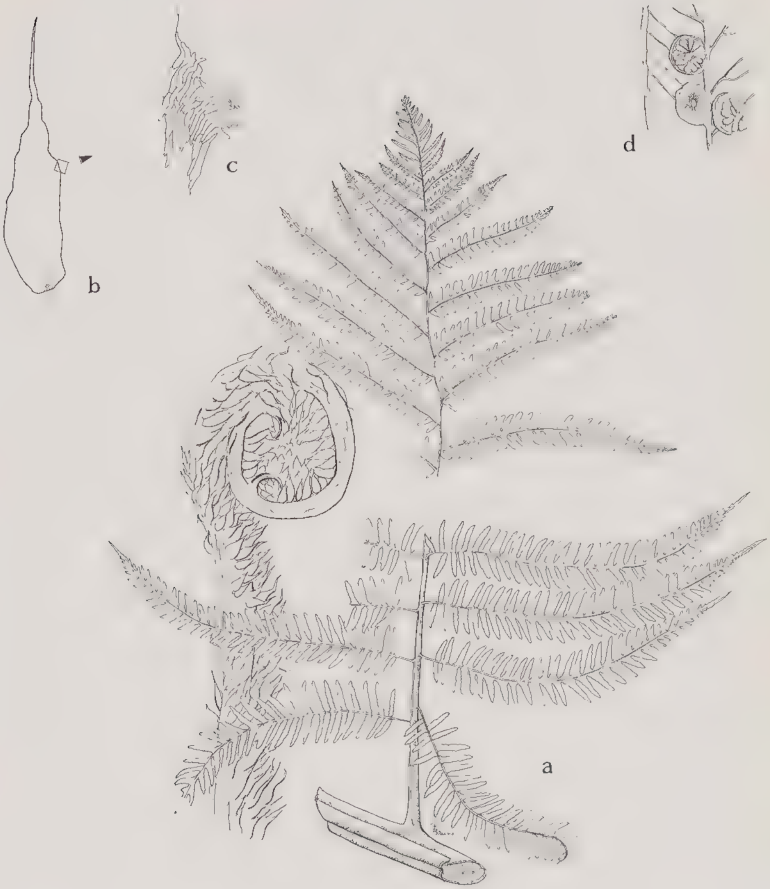

FIGURE 14. **Cyathea.** a–d, *C. arborea*: a, young frond, showing circinnate growth, and section of mature pinna, × 0.4; b, scale from apex of caudex, × 4.0; c, marginal area (inside box), showing cell size and arrangement, × 40.0; d, section of fertile segment, showing venation and sori, the indusium saucer-shaped, persistent, × 4.0.

arching-pendent to ascending, usually very large, 2-pinnate-pinnatifid (in Lesser Antillean species), often pubescent or scaly; stipes thick, curved and densely clothed with scales toward the base, the scales deciduous and often spiny, the veins all free. Sori dorsal on veins, or else arising from vein axils; indusium present or absent, if present subtending the sorus and partially or wholly enclosing it or sometimes reduced to a mere scale; filamentous paraphyses often present. Sporangia borne on an elevated receptacle; pedicel of sporangium short, consisting of 4 rows of cells; spores globose-tetrahedral, smooth or irregularly ridged.

TYPE SPECIES: *Cyathea arborea* (L.) Smith, based on *Polypodium arboreum* L. of the West Indies.

A large and complex genus of more than 600 species, about evenly divided between the New World and Old World tropics. Six species are credited to the Lesser Antilles.

SPECIAL LITERATURE: See references under Cyatheaceae.

KEY TO THE SUBGENERA

a. Scales of the rhizome apex and base of stipe very narrowly linear, 0.1–0.2 mm. wide, usually terminating in a blackish apical bristle; tissue of blades bicolorous, dark green above, pale or glaucous beneath .. Subg. *Nephelea*[3]
a. Scales of the rhizome apex and base of stipe 1–4 mm. wide at or near the base, more or less attenuate at the apex but lacking a blackish apical bristle; blades concolorous or nearly so.
  b. Indusium totally lacking; stipes smooth, completely without spines .... Subg. *Trichopteris*
  b. Indusium present (small or soon disappearing in *C. muricata*); stipes usually spiny, or at least roughened or minutely tuberculate .... Subg. *Cyathea*

Subgenus NEPHELEA

1. **Cyathea imrayana** Hook., Sp. Fil. 1: 18, *t. 9-b.* 1844.

Lectotype: *Imray*, from Couliaban Mountain, Dominica (K).
Syn.: *Cyathea tussacii* sensu Griseb., Fl. Br. W. Ind. 704. 1864, in part, with regard to ref. Guadeloupe and St. Vincent; Duss, Foug. & Lyc. Antill. Franc. 19. 1903, not Desvaux, 1827.
Cyathea caribaea Jenman, Ferns Br. W. Ind. & Guiana 57. 1898. (Type from St. Vincent.)
Cyathea imrayana var. *caribaea* (Jenman) Proctor in Rhodora **63**: 32. 1961.
Nephelea imrayana (Hook.) R. Tryon in Contr. Gray Herb. **200**: 40. 1970.

Caudex up to 8 m. tall and to 15 cm. in diameter, bearing sharp, blackish spines to 9 mm. long. Fronds borne in whorls of 5, these expand-

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[3] *Cyathea* subg. *Nephlea* (R. Tryon) Proctor, stat. nov., based on *Nephelea* R. Tryon in Contr. Gray Herb. **200**: 37. 1970.

ing simultaneously, eventually deciduous and allowing for the growth of succeeding whorls; with pale brown scales; stipes to 50 cm. long or more, beset with sharp, black, slightly recurved spines. Blades ovate-oblong, 2–3 m. long, 1.2–1.6 m. broad, 2-pinnate-pinnatifid; rhachis and costae densely and persistently scurfy-scaly to nearly naked, the scales minute, grayish, with black or brown midrib and 1 to several blackish, apical bristles; costae and costules on upper side bearing stiff recurved hairs; pinnae linear-oblong, abruptly acuminate; ultimate segments linear-oblong, falcate, 6–11 mm. long, 2–3 mm. broad, the margins minutely crenulate, the veins mostly once-forked near the base, minutely glandular on the underside. Sori borne on the basal half of the segments, near the costule; indusium globose, pale reddish-brown, fragile, rupturing irregularly at maturity.

General Distribution: Trinidad, Venezuela; another variety occurs in Costa Rica, Panama, and at scattered localities in northern South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

Habitat: Wet montane forests at chiefly higher elevations.

The population of this species occurring in St. Vincent, Trinidad, and Venezuela has been called *Cyathea caribaea* or *C. imrayana* var. *caribaea*; it differs from the typical Dominican form chiefly in having nearly naked (instead of rather densely scaly) fronds.

Subgenus TRICHOPTERIS [4]

2. **Cyathea hodgeana** Proctor in Rhodora 63: 31. 1961.

Type: *W. H. & B. T. Hodge 3420*, from the Pegoua River Valley near Deux Branches, Dominica (GH).

Syn.: *Trichopteris hodgeana* (Proctor) R. Tryon in Contr. Gray Herb. 200: 44. 1970.

Caudex to 5 m. tall, the apical bud densely clothed with lustrous brown, linear-attenuate, erose-ciliate scales; stipes dark brown, minutely puberulous, at base bearing deciduous scales like those of the apical bud. Blades ovate, 2-pinnate-pinnatifid, ca. 1 m. long; rhachis and costae brown and densely pale-brown-scurfy; costae and costules densely brown-pubescent on upper side, the costules beneath with numerous small, ovate-acuminate, brown, flat scales, the midveins of segments beneath with minute, pale brown, bullate scales; pinnae articulate to the rhachis, narrowly oblong, to 30 cm. long and 11 cm. broad, acuminate, long-

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[4] The spelling *Trichopteris* applied to this subgenus follows the usage of most authors from the time of Presl, and in particular of Morton in Amer. Fern J. 61: 143. 1971, who points out that this spelling is required under the International Rules. This is in contradiction to R. Tryon's insistence on the spelling "*Trichipteris*" (1970).

stalked (petiolules to 1.5 cm. long); pinnules linear-oblong, pinnatifid, stalked (petiolules 1–2 mm. long); segments oblong, to 4 mm. long, ca. 2.5 mm. broad, rounded or blunt, with crenulate margins, the veins in 4–5 pairs, simple or once-forked. Sori supramedial, their positions marked on the upper side by pits; receptacle small, capitate, bearing hair-like paraphyses.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Dominica, known only from the type collection.

Habitat: Moist forest at middle elevations.

Doubtful Record

Cyathea microdonta (Desvaux) Domin, Pteridophyta 264. 1929, was reported from Guadeloupe by Fée (1866) under the name *Alsophila aculeata* (Raddi) J. Smith. No specimen of this species from the Lesser Antilles has been seen during the preparation of this book, and none was cited by Maxon in his study of the group of species to which this belongs (see Contr. U. S. Nat. Herb. **24**: 36. 1922).

Subgenus CYATHEA

Key to the Species

a. Fronds merely 2-pinnate, the pinnules serrate-crenate; pinnae 20–24 cm. long, less than 6 cm. broad .... 3. *C. elliottii*
a. Fronds fully 2-pinnate-pinnatifid; mature pinnae normally more than 35 cm. long and 12 cm. broad.
    b. Costules and midveins glabrous beneath.
        c. Stipe scales dark lustrous brown; indusium one-sided, deeply lacerate, soon deciduous .... 4. *C. muricata*
        c. Stipe scales whitish, creamy, or bicolorous; indusium saucer-shaped, persistent .... 5. *C. arborea*
    b. Costules and midveins pubescent beneath with pluricellular hairs .... 6. *C. tenera*

3. **Cyathea elliottii** (Baker) Domin in Acta Bot. Bohemica **9**: 113. 1930.

Basionym: *Alsophila elliottii* Baker in Ann. Bot. **6**: 96. 1892.
Type: *Elliott*, from Antoine Estate, Bellevue, Grenada (K).
Syn.: *Hemitelia elliottii* (Baker) L. M. Underw. & Maxon in Contr. U. S. Nat. Herb. **17**: 415. 1914.

Caudex said to be "very short," but no measurements given, the scales not described, and none seen; stipes ca. 30 cm. long, armed with sharp, spreading spines. Blades "subdeltoid," 60–90 cm. long, 2-pinnate; rhachis mottled reddish-brown, slightly rough, glabrescent; costae distantly muricate, narrowly winged above; pinnae narrowly oblong-lanceolate, long-acuminate, subsessile; pinnules linear-oblong, 2.5–3 cm. long, 7–9 mm. broad, deeply serrate-crenate, the upper ones adnate; costules beneath bearing occasional flattish or subbullate brownish scales; veins ca. 8 pairs. Sori small, medial; indusium one-sided, small, light brown, somewhat erose.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Grenada, known only from the type collection.

Habitat: Not stated; probably a moist wooded hillside or ravine at medium elevation.

4. **Cyathea muricata** Willd. in L., Sp. Pl. 5: 497. 1810; Griseb., Fl. Br. W. Ind. 704. 1864, in part, with regard to name, but excl. syn. *C. imrayana* and ref. Jamaica.

Type: Plumier, Tr. Foug. *t. 4*, based on material from Cabsterre, Parish of Ste. Marie, Martinique.

Syn.: *Alsophila muricata* (Willd.) Desvaux in Mém. Soc. Linn. Paris 6: 319. 1827.

Disphenia muricata (Willd.) C. Presl in Abh. Böhm. Ges. Wiss. 5: 349. 1848.

Hemitelia muricata (Willd.) Fée, Mém. Fam. Foug. 5: 350. 1852.

Alsophila nitens J. Smith ex Griseb., Fl. Br. W. Ind. 705. 1864, in part, excl. ref. Brazil.

Alsophila infesta sensu Griseb., Fl. Br. W. Ind. 705. 1864, in part, not Kunze, 1834.

Alsophila nitida Kunze ex Ettingsh., Farnkr. Jetzw. *222*, *t. 154*, *figs. 4*, *8*; *t. 155*, *figs. 1*, *7*. 1865. (Type from Martinique.)

Alsophila aspera sensu Duss, Foug. & Lyc. Antill. Franc. 20. 1903, not R. Br., 1810.

Caudex usually 4–6 m. tall, spiny near the apex; stipes 50–100 cm. long, usually dark brown, persistently attached to the caudex, minutely scurfy when young, armed with short, straight spines. Blades up to 3 m. long and 1.5 m. broad, 2-pinnate-pinnatifid; rhachis usually dark purple-brown, often sparsely and minutely spiny; costae similar but usually smooth; pinnae 40–70 cm. long, 12–21 cm. broad, abruptly acuminate; pinnules ca. 25 pairs, linear-oblong, 7–12 cm. long, 1.5–3 cm. broad, stalked, articulate, deeply pinnatifid; costules antrorsely strigose above, beneath bearing scattered brown, flat or subbullate scales (the larger ones fimbriate-lacerate toward apex); segments oblong, 7–15 mm. long, 3–5 mm. broad, slightly falcate, somewhat acute, crenulate; veins 5–10 pairs, mostly once-forked. Sori located on vein forks, their position marked on the upper surface by pits; indusium variable, scalelike or more usually deeply lacerate, the lower portion broad or very narrow, more or less deciduous.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

Habitat: Moist forests at chiefly middle elevations; plants common.

5. **Cyathea arborea** (L.) Smith in Mém. Acad. Turin **5**: 417. 1793.

Basionym: *Polypodium arboreum* L., Sp. Pl. **2**: 1092. 1753.
Type: Plumier, Tr. Foug. *t. 1*, in part, and *t. 2*, based on material from Morne de la Calebasse, Martinique.
Syn.: *Cyathea serra* Willd. in L., Sp. Pl. **5**: 491. 1810. (Type from Venezuela.)
Cyathea guadeloupensis Sprengel in Nova Acta Acad. Caes. Leop.-Carol. **10**: 233. 1821. (Type from Guadeloupe.)
Hemitelia serra (Willd.) Desvaux in Mém. Soc. Linn. Paris **6**: 221. 1827.
Disphenia arborea (L.) C. Presl, Fam. Tent. Pter. 56. 1836.
Hemitelia arborea (L.) Fée, Mém. Fam. Foug. **5**: 350. 1852.
Cormophyllum arboreum (L.) Newman in Phytol. **5**: 238. 1854.
Cyathea barbata Bory ex Kuhn in Linnaea **36**: 164. 1869. (Type from Guadeloupe.)

Caudex to 10 (rarely to 15) m. tall, usually without spines, densely clothed toward the apex with whitish or creamy (rarely brownish or bicolorous) scales to 4 cm. long. Fronds deciduous, leaving oval scars on the caudex; stipes relatively short (25–60 cm.), yellowish, minutely scurfy when young, usually more or less roughened-tuberculate but rarely armed with spines, densely clothed toward base with deciduous, whitish or creamy (rarely brownish or bicolorous), lance- to narrowly ovate-attenuate scales. Blades ovate, 2–3.5 m. long, 2-pinnate-pinnatifid, essentially glabrous, the tissue light green and of rather heavy texture; pinnae 40–80 cm. long, 15–35 cm. broad, stalked; pinnules lance-oblong to elliptic-lanceolate, attenuate, all but the lowest sessile; segments narrowly oblong-subfalcate, dilated at base, serrate, the midveins beneath with 1 or 2 deciduous, white, bullate scales at the base; veins 10–14 pairs, these 1- to 3-forked. Sori with erect, clavate receptacle; indusium firm, saucer-shaped, persistent.

General Distribution: Greater Antilles; reported from Mexico and Venezuela.

Distribution in Lesser Antilles: Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Moist clearings, open hillsides, and rain forest glades at lower to middle elevations; plants common.

6. **Cyathea tenera** (J. Smith ex Hook.) T. Moore, Ind. Fil. 274. 1861.

Basionym: *Alsophila tenera* J. Smith in London J. Bot. 1: 666. 1842, nomen nudum; J. Smith ex Hook., Sp. Fil. 1: 49. 1844.
Type: *Caley*, from St. Vincent (BM, isotype).

Caudex to 8 m. tall, somewhat spiny, densely clothed at apex with linear-attenuate, lustrous golden-brown scales; stipes 40–60 cm. long, brown, near base bearing a few scales like those of the caudex, rather densely short-spiny (spines 2–5 mm. long). Blades ovate, 1.5–2 m. long; rhachis minutely puberulous and sparsely short-spiny; costae and costules finely pubescent, especially on the upper side; costules and midveins beneath with numerous erect or spreading hairs and scattered, minute, yellowish-brown, bullate scales; pinnules 7–10 cm. long, 1.2–1.7 cm. broad, subsessile, deeply pinnatifid; segments oblong, subfalcate, obtuse, crenate-serrulate; veins 5–8 pairs, simple or once-forked. Sori inframedial; indusium globose, membranous, fragile, rupturing irregularly at maturity and often then disappearing except for a small basal disc.

GENERAL DISTRIBUTION: Cuba, Hispaniola, Trinidad, Margarita Island, Costa Rica.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Moist forests at chiefly middle elevations; plants frequent.

CNEMIDARIA Presl

Cnemidaria C. Presl, Tent. Pter. 56, *t. 1, figs. 16–18.* 1836. FIGURE 15.

Caudex relatively short, ascending to erect, densely clothed with adventitious roots, scaly and sometimes spiny at the apex. Fronds (in Lesser Antillean species) ascending or arching, pinnate-pinnatifid, the leafy parts relatively broad, essentially glabrous; stipes nearly smooth to tuberculate, rarely with spines, usually densely clothed with scales that are often bicolorous with dark central portion and pale margins. Basal veins of adjacent segments joined by a transverse veinlet, thus forming costal areoles (or in some continental species these veins upturned and connivent at the sinus). Sori dorsal on veins, each subtended by a one-sided indusium (irregularly half-cup-shaped or variously lobed); paraphyses rudimentary. Sporangia borne on a raised capitate receptacle; spores globose-tetrahedral with equatorial pores or often with almost spherical cavities in the thickened lateral walls.

TYPE SPECIES: *Cnemidaria speciosa* C. Presl, of Peru.

A tropical American genus of 23 known species, probably an evolutionary derivative of *Cyathea* but for the most part reasonably distinct.

SPECIAL LITERATURE: Maxon, The North American species of *Hemitelia* subgenus *Cnemidaria*, in Contr. U. S. Nat. Herb. 16: 25–49, *t. 18–26.* 1912;

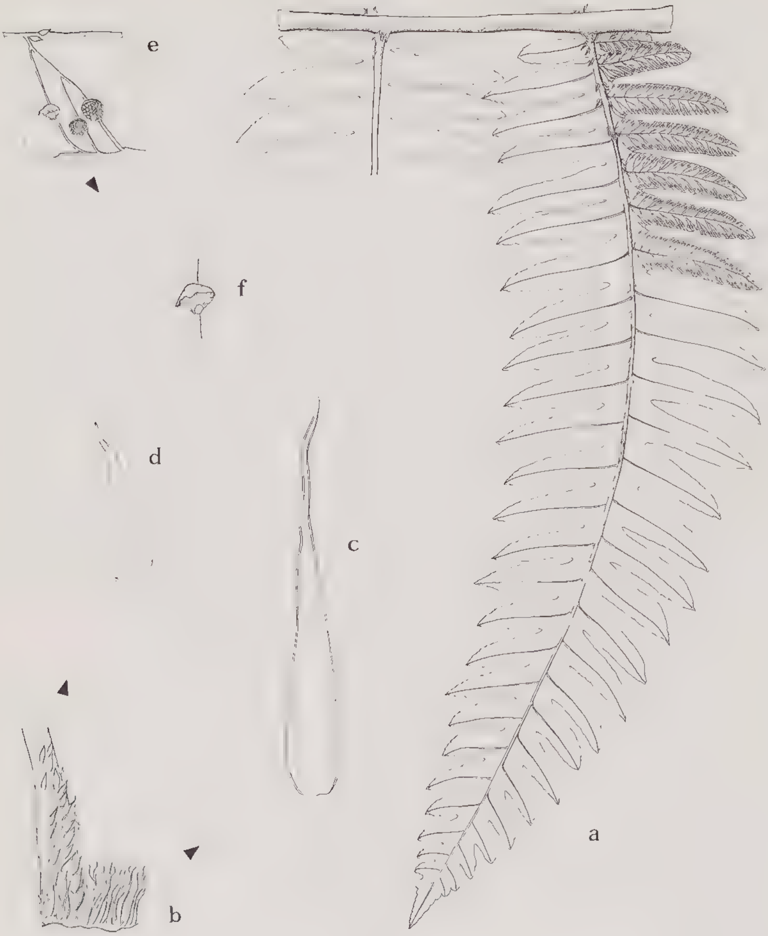

FIGURE 15. **Cnemidaria.** a–f, *C. grandifolia* var. *grandifolia*: a, section of frond showing a single complete pinna, × 0.4; b, apical section of caudex, × 0.4; c, d, two types of scales from caudex, × 2.4; e, section of fertile segment, showing venation and sori, × 2.4; f, half-cup-shaped indusium, × 4.0.

Stolze, A taxonomic revision of the genus *Cnemidaria* (Cyatheaceae), in Fieldiana Bot. 37: 1–98, *figs. 1–26, 14 maps.* 1974.

1. **Cnemidaria grandifolia** (Willd.) Proctor in Rhodora 63: 32. 1961.

Basionym: *Cyathea grandifolia* Willd. in L., Sp. Pl. 5: 490. 1810.
Type: Collector not stated, *Herb. Willd. 20167*, from Martinique (B).
Syn.: *Hemitelia grandifolia* (Willd.) Sprengel in L., Syst. Veg. 4: 125. 1827.
Cnemidaria kohautiana C. Presl, Tent. Pter. 57. 1836. (Type from Martinique.)
Hemitelia imrayana Hook., Ic. Pl. 7: *t. 669.* 1844. (Type from Dominica.)
Hemitelia kohautiana (C. Presl) Kunze in Bot. Zeit. 2: 298. 1844.
Hemistegia grandifolia C. Presl, Gefässb. Stipes der Farrn 47. 1847.
Microstegnus grandifolius (Willd.) C. Presl, Gefässb. Stipes der Farrn 46. 1847.
Hemistegia kohautiana (C. Presl) C. Presl, Gefässb. Stipes der Farrn 47, 1847.
Hemistegia willdenovii Fée, Mém. Fam. Foug. 5: 351. 1852.
Hemitelia horrida var. *imrayana* Hook. in Hook. & Baker, Syn. Fil. 28. 1865.
Hemistegia insignis Fée, Mém. Fam. Foug. 11: 99. 1866. (Type from Guadeloupe.)
Hemitelia insignis (Fée) C. Chr., Ind. Fil. 349. 1905.
Cyathea kohautiana (C. Presl) Domin, Pteridophyta 264. 1929.
Cyathea insignis (Fée) Domin, Pteridophyta 264. 1929.
Hemitelia obtusa var. *kohautiana* (C. Presl) Domin, Pter. Dominica 71. 1929.
Cyathea antillana Domin in Acta Bot. Bohemica 9: 91. 1930.
Cyathea obtusa var. *kohautiana* (C. Presl) Domin in Acta Bot. Bohemica 9: 142. 1930.

Caudex erect, rarely to 2 m. tall (usually less), and to 4 cm. in diameter, densely clothed at the apex with lanceolate scales varying from whitish with a faint central brown line to lustrous brown with a faint whitish margin; stipes mostly 45–125 cm. long, purplish-brown at base, muricate-roughened to sharply spiny, and densely clothed with deciduous scales, these lanceolate with attenuate to filiform-contorted apex. Blades oblong-ovate to ovate, to 2.5 m. long and 1 m. broad; rhachis bearing small scattered scales; pinnae sessile, narrowly oblong or oblong-lanceolate, pinnatifid (cut ¾ or more to the costa), the lowest 1–3 pairs shorter than the middle ones and more or less deflexed, the apical one narrowly deltate and deeply pinnatifid, tapering to a narrowly acuminate, subentire tip; segments more or less falcate, obtuse to acuminate, the midveins bearing minute, bullate scales beneath, the margins finely crenate-serrulate; veins 1- to 4-forked (rarely more). Sori supramedial to nearly submarginal; indusium yellow-brown or brown, semicircular, simple or several-lobed.

This species, traditionally treated as three species, has been shown by Stolze (1974) to be better considered as a single taxon divided into two geographically separated varieties. These can be distinguished as follows:

a. Stipes roughened-muricate to very short-spiny; scales of stipe bases whitish or strongly bicolorous; segments mostly subacute to acuminate (rarely obtuse), the midveins beneath bearing whitish bullate scales, these glabrous and with an acuminate-attenuate apex .... 1a. var. *grandifolia*

a. Stipes sharply spiny (spines to 3 mm. long); scales of stipe bases lustrous dark brown with faint whitish margin; segments always obtuse, the midveins beneath with yellowish- to reddish-brown bullate scales, these ciliate-fimbriate at the mostly obtuse apex .... 1b. var. *obtusa*

1a. **Cnemidaria grandifolia** var. **grandifolia**

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Moist shaded banks and gullies at chiefly middle elevations.

1b. **Cnemidaria grandifolia** var. **obtusa** (Kaulf.) Stolze in Fieldiana Bot. 37: 47. 1974.

Basionym: *Hemitelia obtusa* Kaulf., Enum. Fil. 252. 1824.

Type: Collector not stated, found "in Antillis." Stolze (1974) has suggested that *Ryan*, from Montserrat, and *Sieber Fl. Mixta 331* may be possible syntypes, but the Ryan collection is geographically unlikely to say the least.

Syn.: *Cnemidaria obtusa* (Kaulf.) C. Presl, Tent. Pter. 57. 1836.
Hemistegia obtusa (Kaulf.) C. Presl, Gefässb. Stipes der Farrn 47. 1847.
Hemitelia bullata Christ in Engl. Bot. Jahrb. **24**: 81. 1897. (Type from Grenada.)
Hemitelia obtusa var. *bullata* (Christ) Domin, Pter. Dominica 71. 1929.
Cyathea obtusa (Kaulf.) Domin, Pteridophyta 264. 1929.
Cyathea obtusa var. *bullata* (Christ) Domin in Acta Bot. Bohemica **9**: 142. 1930.

General Distribution: Tobago, Trinidad, Margarita Island, Venezula.

Distribution in Lesser Antilles: St. Vincent, Grenada.

Habitat: Moist shaded banks and gullies at chiefly middle elevations.

Doubtful Record

Culcita coniifolia (Hook.) Maxon, of the family Dicksoniaceae, was reported from Guadeloupe by Grisebach (1864). I have not been able to find the basis for his record and no one since has collected this species in the Lesser Antilles. This is a plant of moist montane forests at rather high elevations, with a creeping woody rhizome densely clothed with glistening red-brown hairs, and deltate 3- to 4-pinnate blades. The sori are marginal and purse-shaped. It is known from the Greater Antilles (except Puerto Rico) and continental tropical America from Mexico to Brazil.

Family POLYPODIACEAE

Small to rather large leafy plants of various habit, terrestrial or epiphytic, with the rhizomatous stem (rhizome) creeping to erect, producing few or many roots, and usually bearing hairs or scales. Fronds usually stipitate, either uniform or dimorphic, the blades simple to several-times pinnately compound (rarely flabellate). Sporangia long-stalked (pedicels with 1-4 rows of cells), arranged in lines or clusters (sori), or completely covering the under (abaxial) sides of leafy or nonleafy fronds. Sori naked or protected by a scalelike indusium of characteristic form, developing either from the veins or margin of the blade or sometimes the sori protected by an infolding or inrolling of the whole margin; annulus of the sporangium vertical, interrupted by a stomium of several thin-walled cells, rupturing transversely to release the spores; spores bilateral to tetrahedral, smooth or with perispore variously sculptured or spinulose. Gametophytes green, flat, usually more or less cordate (ribbonlike or subfilamentous chiefly in Grammitidoideae and Vittarioideae), glabrous or hairy, sometimes gladular.

More than 170 genera (up to 250 or more recognized by some authors) and perhaps as many as 10,000 species. There is a wide divergence of view among pteriodologists as to whether the family should be maintained (as it is here) in a broad, inclusive sense or split into numerous (as many as 33) smaller families. The present treatment is based on the belief that the group as a whole has originated from a common ancestral pool (as shown by numerous morphological similarities and the sharing of such highly specialized structures as the annulus of the sporangium). It is recognized that in any large, diverse, and ancient group of organisms there will normally have emerged several or many lines of evolutionary development: such lines occur in the ferns. But the differentiation that has taken place is not, in this writer's opinion, of a sufficient order of magnitude to justify taxonomic separation at the family level. In this view, all "polypodioid" ferns *sensu lato* are basically related and have reached approximately the same stage of evolutionary development; they form a natural family.

The defining of phyletic lines and the establishment of degrees of intrafamily relationships is a subject of much deliberation and controversy. In the following treatment, the genera of Polypodiaceae are grouped in subfamilies, which in turn are arranged in a sequence which attempts to bring related phyletic lines into relative proximity. However, it must be recognized that a linear sequence of taxa must necessarily be more of an intellectual exercise than an accurate reflection of reality.

Arrangement of the Subfamilies and Genera of the Polypodiaceae[5]

Subfamily	Genus & Number of Species	Base Chromosome Numbers
I. Dennstaedtioideae	*Dennstaedtia* (1)	47
II. Davallioideae	*Saccoloma* (2)	47 (?)
	Lindsaea (5)	44 (?)
	Ormoloma (1)	—
	Odontosoria (1)	48
III. Pteridoideae	*Hypolepis* (1)	29
	Anisosorus (1)	50
	Pteridium (1)	52
	Lonchitis (1)	38
	Histiopteris (1)	48
	Pteris (1)	29
	Neurocallis (1)	—
	Acrostichum (2)	30
IV. Blechnoideae	*Blechnum* (11)	29, 31, 33, 36
	Salpichloena (1)	—
V. Adiantoideae	*Eriosorus* (1)	29 (?)
	Pityrogramma (2)	30
	Hemionitis (1)	30
	Doryopteris (2)	30
	Cheilanthes (1)	29
	Adiantopsis (1)	—
	Adiantum (13)	29, 30
VI. Oleandroideae	*Oleandra* (1)	41
VII. Dryopteridoideae	*Peltapteris* (1)	—
	Elaphoglossum (21)	41
	Hymenodium (1)	41
	Bolbitis (2)	41
	Lomariopsis (1)	—
	Polybotrya (2)	41
	Nephrolepis (3)	41
	Cyclopeltis (1)	41
	Hypoderris (1)	—
	Tectaria (4)	40

[5] This list summarizes the arrangement of subfamilies and genera of the Polypodiaceae used in this book. The generic names are accompanied by reported chromosome counts for one or more species. Characteristic base numbers are taken chiefly from studies of Jamaican plants by T. L. Walker (Trans. Roy. Soc. Edinb. **66**(9): 169–237, 1966; *Ibid.* **69**(5): 109–135, 1973). These numbers are believed to be significant in indicating relationships.

	Ctenitis (7)	41
	Lastreopsis (1)	41
	Polystichopsis (1)	41
	Polystichum (2)	41
	Stigmatopteris (1)	41
	Diplazium (14)	41
VIII. Thelpteridoideae	*Macrothelypteris* (1)	31
	Thelypteris (38)	29, 31, 36
IX. Asplenioideae	*Asplenium* (17)	36
X. Polypodioideae	*Polypodium* (22)	33–37
	Neurodium (1)	37
	Dicranoglossum (1)	—
XI. Grammitidoideae	*Grammitis* (22)	33, 37
	Cochlidium (2)	—
XII. Vittarioideae	*Hecistopteris* (1)	—
	Anetium (1)	30
	Polytaenium (2)	30
	Vittaria (2)	30
	Ananthacorus (1)	30

Key to the Subfamilies

- a. Blades pinnatifid to variously compound.
  - b. Sporangia grouped in marginal or submarginal sori, terminal on veins.
    - c. Indusium opening toward margin of blades.
      - d. Rhizome clothed with hairs only; ultimate divisions not cuneate .... I. *Dennstaedtioideae*
      - d. Rhizome clothed with scales .... II. *Davallioideae*
    - c. Indusium (or indusioid structures) opening inwardly from the margin, or else absent.
      - e. Rhizome clothed with hairs only .... III. *Pteridoideae* (in part)
      - e. Rhizome bearing scales.
        - f. Sori short (mostly not longer than broad), or if elongate, the stipes black and wiry .... V. *Adiantoideae* (in part)
        - f. Sori elongate; stipes not black and wiry.
          - g. Blades pinnatisect or subdichotomous with few elongate divisions; indusium lacking; tissue minutely scaly beneath .... X. *Polypodioideae* (*Dicranoglossum*)
          - g. Blades 1- to 4-pinnate; indusium present; tissue without scales .... III. *Pteridoideae* (in part)
  - b. Sporangia dorsal on veins or tissue, either scattered along veins, a dense cover, or else clumped in discrete sori usually inward from the margins.
    - h. Sporangia scattered, not clumped in definite sori; indusium always lacking.
      - i. Sporangia confined to the veins of ordinary fronds .... V. *Adiantoideae* (in part)

i. Sporangia densely scattered over the abaxial tissue of special fertile blades or pinnae, apparently not confined to the veins in lines.

j. Fertile and sterile fronds 1-pinnate.

k. Rhizome massive, erect; plants of wet saline or brackish habitats .... III. *Pteridoideae* (*Acrostichum*)

k. Rhizome elongate, creeping or scandent; plants of moist forests, never in saline habitats .... VII. *Dryopteridoideae* (in part)

j. At least the fertile fronds 2- to 4-pinnate .... VII. *Dryopteridoideae* (*Polybotrya*)

h. Sporangia clumped in definite sori, with or without indusium.

l. Sori round or nearly so.

m. Pinnae articulated to the rhachis .... VII. *Dryopteridoideae* (*Nephrolepis*, *Cyclopeltis*)

m. Pinnae continuous with the rhachis.

n. Indusium present (obvious or minute).

o. Midribs of pinnae grooved on upper side, the groove continuous with that of the rhachis (the raised edges decurrent); hairs if present often pluricellular, never forked or stellate ... VII. *Dryopteridoideae* (in part)

o. Midribs of pinnae raised on the upper side at base (if grooved above the base, the edges never decurrent); hairs if present often unicellular, sometimes forked or stellate, or simple and pluricellular .... VIII. *Thelypteridoideae* (in part)

n. Indusium absent.

p. Stipes articulate to the rhizome, never with long spreading hairs; plants usually epiphytic or on rocks; spores brown, bilateral .... X. *Polypodioideae* (in part)

p. Stipes not articulate to the rhizome (or rarely obscurely so); plants terrestrial or epiphytic; stipes with or without spreading hairs.

q. Plants epiphytic (rarely on mossy rocks); fresh ripe spores green, tetrahedral .... XI. *Grammitidoideae* (in part)

q. Plants terrestrial; spores brown to black.

r. Veins all free, not reaching the margins, each ending in an enlarged tip (hydathode); tissue minutely punctate with translucent dots; hairs lacking .. VII. *Dryopteridoideae* (*Stigmatopteris*)

r. Veins free or some joined in the tissue, the free ones all reaching the margins; tissue not punctate; hairs often present .... VIII. *Thelypteridoideae* (in part)

l. Sori oblong to linear.

s. Indusium absent, or if present surrounded on both sides by sporangia; scales not clathrate .... VIII. *Thelypteridoideae* (in part)

s. Indusium present, attached laterally (sporangia all on one side).

t. Sori parallel to the midrib or costa .... IV. *Blechnoideae*

t. Sori oblique to the midrib or costa.

u. Rhizome scales more or less clathrate; sori never doubled or paired on a single vein; top of stipe containing an X-shaped stele; sporangium pedicels chiefly of 1 row of cells .... IX. *Asplenioideae*

u. Rhizome scales not clathrate; sori often (but not always) doubled or paired on a single vein; top of stipe containing a U-shaped stele; sporangium pedicels chiefly of 3 rows of cells ... VII. *Dryopteridoideae* (*Diplazium*)

a. Blades simple or furcate to flabellate, the lateral margins entire or nearly so.

v. Sporangia densely scattered over the underside of tissue of special fertile fronds .... VII. *Dryopteridoideae* (*Elaphoglossum*, *Hymenodium*)

v. Sporangia associated in definite lines or clusters (sori).

w. Sori round.

x. Stipes articulate to the rhizome and never with long spreading hairs.

y. Indusium present .... VI. *Oleandroideae*

y. Indusium lacking .... X. *Polypodioideae* (in part)

x. Stipes not articulate to the rhizome; fronds never with scales; spores green, tetrahedral .... XI. *Grammitidoideae* (in part)

w. Sori elongate, either superficial or in grooves; fronds always glabrous and without scales.

z. Rhizome scales strongly clathrate and often grayish-iridescent.

aa. Veins reticulate, the areoles with included free veinlets; blades fertile chiefly toward the apex; spores minutely tuberculate .... X. *Polypodioideae* (in part)

aa. Veins reticulate or all free, if reticulate the areole without included free veinlets; sori not usually confined to apical part of blade; spores smooth .... XII. *Vittarioideae*

z. Rhizome scales not clathrate, light reddish-brown; veins all free .. .. XI. *Grammitidoideae* (*Cochlidium*)

Subfamily DENNSTAEDTIOIDEAE

DENNSTAEDTIA Bernhardi

Dennstaedtia Bernh. in J. Bot. Schrader 1800(2): 124. 1801.

FIGURE 16.

Mostly large terrestrial ferns of moist gullies, thickets and rain forests. Rhizome slender, long-creeping, densely hairy but lacking scales. Fronds distantly attached at forks in the rhizome, long-stipitate, without scales. Blades deltate, pinnately dissected, with anadromous venation, the veins all free. Sori marginal, terminal on single veins, separate; indusium adnate to the lateral margins of a minute, modified frond lobule, forming a cup-shaped or slightly bivalvate soral pouch, this usually deflexed.

TYPE SPECIES: *Dennstaedtia flaccida* (Forst.) Bernh., based on *Trichomanes flaccidum* Forst., occurring on islands of the Pacific.

A worldwide genus of perhaps 70 species, of which only one is at present definitely known from the Lesser Antilles. However, one or two other records now considered doubtful may yet be authenticated.

SPECIAL LITERATURE: R. Tryon, A review of the genus *Dennstaedtia* in America, in Contr. Gray Herb. 187: 23–52, *t. 1–8*. 1960.

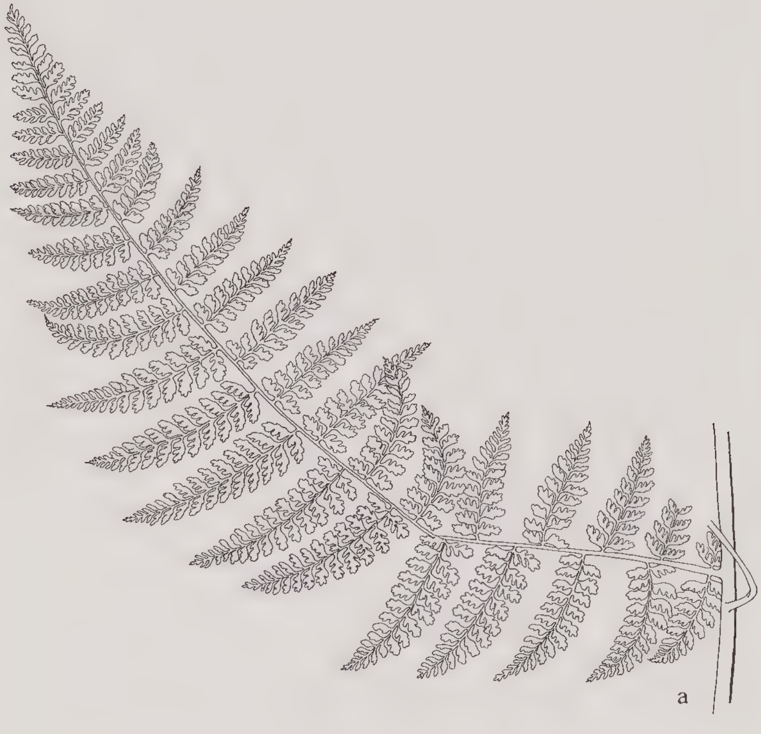

FIGURE 16. **Dennstaedtia.** a, *D. obtusifolia*, pinna, one segment with marginal sori, × 0.4.

1. **Dennstaedtia obtusifolia** (Willd.) T. Moore, Ind. Fil. 306. 1861.

Basionym: *Dicksonia obtusifolia* Willd. in L., Sp. Pl. **5**: 483. 1810.
Type: *Bredemeyer, Herb. Willd. 20163,* from Caracas, Venezuela (B).
Syn.: *Dicksonia ordinata* Kaulf., Enum. Fil. 226. 1824. (Type from Puerto Rico.)
Acrostichum dicksonioides Desvaux in Mém. Soc. Linn. Paris **6**: 212. 1827.
Microlepia incisa Fée, Mém. Fam. Foug. **5**: 328. 1852. (Type from Guadeloupe.)
Dennstaedtia ordinata (Kaulf.) T. Moore, Ind. Fil. 306. 1861.
Dicksonia incisa Fée, Mém. Fam. Foug. **11**: 94, *t. 25, fig. 1.* 1866. (Type from Guadeloupe.)
Dicksonia cicutarioides Fée, Mém. Fam. Foug. **11**: 95, *t. 25, fig. 2.* 1866. (Type from Guadeloupe.)
Dennstaedtia incisa (Fée) Kuhn in Linnaea **36**: 146. 1869.
Dennstaedtia cicutarioides (Fée) Hieron. in Engl. Bot. Jahrb. **34**: 454. 1904.

Rhizome 1 cm. in diameter or less. Fronds to 4 m. long; stipe about one-half as long as the blade. Blades deltate, tripinnate-pinnatifid or nearly 4-pinnate, up to 1 m. broad (sometimes more) at base, acuminate at apex, the vascular parts minutely crispate-pubescent beneath. Mature sori mostly 0.5–1.0 mm. broad and thick (thus distinguished from the similar *D. dissecta* (Sw.) T. Moore, which has sori 1–1.5 mm. broad and about half as thick).

General Distribution: Greater Antilles except Cuba; Trinidad, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist gullies and margins of clearings at middle elevations.

Doubtful Records

The following species were recorded (as *Dicksonia*) from the French Antilles (chiefly Guadeloupe) by Duss (Foug. & Lyc. Antill. Franc. 23, 24. 1903), but none of these reports were substantiated in preparing the present volume.

Dennstaedtia cicutaria (Sw.) T. Moore, Ind. Fil. xcvii. 1857.

Dennstaedtia dissecta (Sw.) T. Moore, Ind. Fil. 305. 1861. This was probably a misidentification of *D. obtusifolia.*

Dennstaedtia rubiginosa (Kaulf.) T. Moore, Ind. Fil. xcvii. 1857. This is now considered synonymous with *D. cicutaria.*

Subfamily DAVALLIOIDEAE

Key to the Genera

a. Fronds determinate, not scandent, never with spines.
  b. Rhizome stout, woody, decumbent to erect, more than 1 cm. thick; ultimate divisions not dimidiate; sori short, the indusium obconic, attached at sides as well as base .... 2. *Saccoloma*
  b. Rhizome slender, creeping, 4 mm. thick or less; indusium attached at base only.
    c. Ultimate divisions dimidiate; sori elongate, continuous or nearly so .... 3. *Lindsaea*
    c. Ultimate divisions not dimidiate; sori short, discontinuous, each usually terminating a single vein .... 4. *Ormoloma*
a. Fronds indeterminate, scandent or trailing, at least some of the axes bearing small spines .... 5. *Odontosoria*

SACCOLOMA Kaulfuss

Saccoloma Kaulf. in Berl. Jahrb. Pharm. **21**: 51. 1820; Enum. Fil. 224. 1824. FIGURE 17.

Syn.: *Orthiopteris* Copel. in Bishop Mus. Bull. **59**: 14. 1929.

Medium to large terrestrial ferns of rain forests. Rhizome stout, woody, decumbent to erect, bearing stiff scales at the apex. Fronds clustered, glabrous, 1-pinnate to decompound. Sori submarginal, terminal on single veins, separate, each adjacent to a small concave marginal crenation; indusium obconic, drawn to a short point on the originating vein, the sides usually attached, opening toward the margin. Sporangia with annulus of 15–23 cells; spores tetrahedral-globose, marked with numerous long, narrow ridges.

Type species: *Saccoloma elegans* Kaulf., widely distributed in the American tropics, but so far not recorded from the Lesser Antilles.

Special literature: R. Tryon, Taxonomic Fern Notes. III. 4. The genus *Saccoloma* Kaulf., in Contr. Gray Herb. **191**: 100–106. 1962.

Key to the Species

a. Blades 2- to 3-pinnate, coarsely cut into mostly large, entire to shallowly toothed ultimate segments; sori close (mostly on adjacent vein ends); indusium broadly cuneate, nearly equalling the short, somewhat modified marginal lobule .... 1. *S. domingense*
a. Blades 3- to 4-pinnate, rather finely cut into mostly small, strongly toothed or lobed ultimate segments; sori distant; indusium narrowly cuneate, distinctly shorter than the unaltered opposed margin .... 2. *S. inaequale*

1. **Saccoloma domingense** (Sprengel) C. Chr., Ind. Fil. 209. 1905; 612. 1906.

Basionym: *Davallia domingensis* Sprengel, Anleit. Gewächse 3: 149, *t. 4, fig. 33.* 1804.

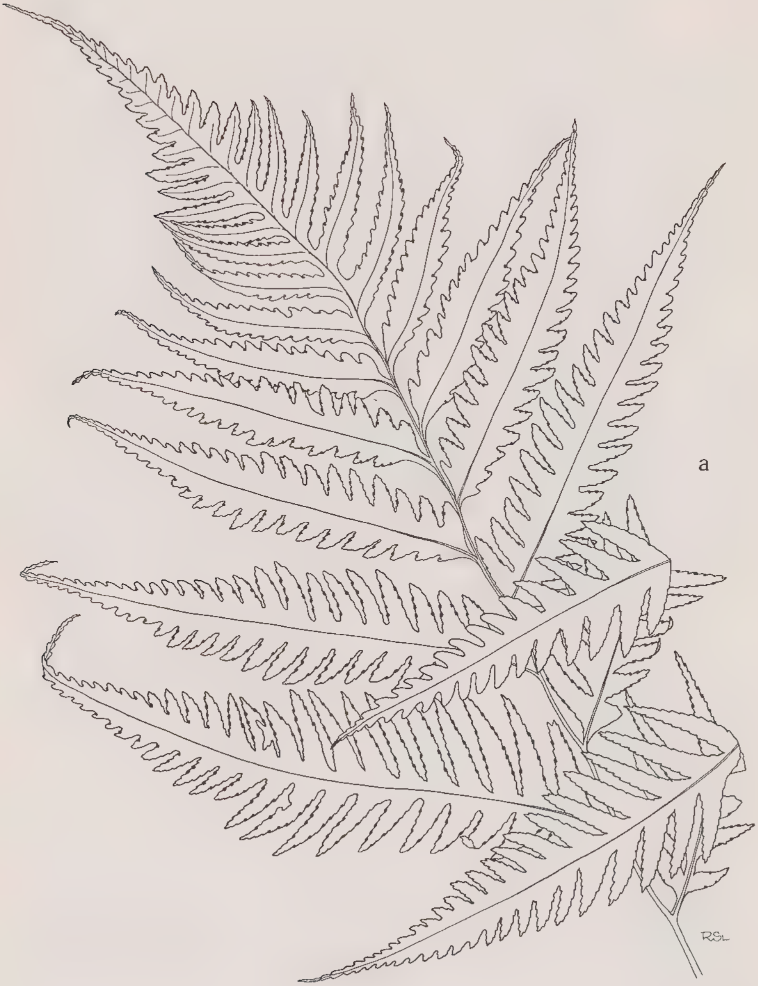

FIGURE 17. **Saccoloma.** a, *S. domingense*, apex of blade with marginal sori, × 0.4.

Lectotype: Plumier, Tr. Foug. *t. 7*, based on material from Hispaniola. Sprengel states that he had a specimen "sent through a friend," but the identity of this specimen and its present location if still extant, are not known to the present writer. It seems better to designate a lectotype whose identity and origin are clear, and which is widely accessible.

Syn.: *Polypodium adiantoides* Aubl., Pl. Guian. **2**: 962. 1775, not Burm., 1768. (Lectotype: Plumier, Tr. Foug. *t. 7.*)

Davallia adiantoides Sw., Syn. Fil. 131. 1806. (Although Swartz cited the same Plumier plate (Tr. Foug. *t. 7.*), he made no reference to Aublet's use of the same specific epithet. It is necessary, therefore, to treat Swartz's *D. adiantoides* as a new name, and not as a new combination. In any case, this usage is in accordance with Article 72 of the *International Rules of Botanical Nomenclature.*

Cibotium adiantoides (Sw.) C. Presl, Tent. Pter. 69. 1836.

Microlepia adiantoides (Sw.) J. Smith in London J. Bot. **1**: 427. 1842.

Dicksonia plumieri Hook., Sp. Fil. **1**: 72. 1844. (Type: Plumier, Tr. Foug. *t. 7.*)

Dicksonia lindeni Hook., Sp. Fil. **1**: *t. 25-b.* (Type from Venezuela.)

Patania adiantoides (Sw.) C. Presl, Epim. Bot. 102. 1852.

Microlepia lindenii (Hook.) Fée, Mém. Fam. Foug. **5**: 327. 1852.

Microlepia plumieri (Hook.) Fée, Mém. Fam. Foug. **5**: 327. 1852.

Saccoloma adiantoides (Sw.) Mettenius in Ann. Sci. Nat. Bot. IV, **15**: 80. 1861.

Pteris crassipes sensu Griseb., Fl. Br. W. Ind. 669. 1864, in part, not Agardh, 1839.

Sitolobium plumieri (Hook.) J. Smith, Ferns Brit. & For. ed. 2, 319. 1877.

Saccoloma plumieri (Hook.) Christ, Farnkr. 309. 1897.

Dicksonia plumieri var. *lindenii* (Hook.) Duss, Foug. & Lyc. Antill. Franc. 24. 1903.

Ithycaulon domingense (Sprengel) C. Chr., Ind. Fil. Suppl. **III**: 116. 1934.

Orthiopteris domingensis (Sprengel) Copel., Gen. Fil. 50. 1947.

Rhizome stout, ascending, clothed at apex with stiff, dark brown, cordate-oblong scales. Fronds clustered, up to 3 m. long; stipes stout, about as long as the blades, naked except for a few scales at the extreme base. Blades elongate-deltate, up to 1 m. broad at the base; pinnae alternate, oblique-spreading, strongly inequilateral, mostly stalked; ultimate divisions with margins crenate or obtusely lobed, the segments mostly relatively large and confluent.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad (probably), northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent.

HABITAT: Montane rain forests and moist ravines at middle elevations.

2. **Saccoloma inaequale** (Kunze) Mettenius in Ann. Sci. Nat. Bot. IV, 15: 80. 1861.

Basionym: *Davallia inaequalis* Kunze in Linnaea **9:** 87. 1834.
Type: *Poeppig, Diar. 2113*, collected near Yurimaguas (now Alto Amazonas), Dept. Loreto, Peru (B, isotype). This is perhaps better designated lectotype since Kunze's holotype, formerly at Leipzig, no longer exists.
Syn.: *Microlepia inaequalis* (Kunze) C. Presl, Tent. Pter. 125. 1836.
Davallia l'herminieri Kunze in Bot. Zeit. **1850:** 132. 1850. (Type from Guadeloupe.)
Microlepia l'herminieri (Kunze) T. Moore, Ind. Fil. 296. 1861.
Saccoloma l'herminieri (Kunze) Knuth in Repert. Sp. Nov. Beih. **43:** 30. 1926.
Ithycaulon inaequale (Kunze) Copel. in Univ. Calif. Publ. Bot. **16:** 80. 1929.
Orthiopteris inaequalis (Kunze) Copel., Gen. Fil. 50. 1947.

Rhizome stout, erect, clothed at apex with thick, dark brown, lance-attenuate scales. Fronds to 2 m. long or more; stipes stout, nearly as long as the blades, deciduously scaly near the base. Blades deltate, to 1 m. long or more, nearly as broad at base; pinnae alternate, oblique-spreading, inequilateral, stalked, the pinnules anadromous; ultimate segments oblique, lance-deltate to ovate-oblong, mostly 1–2 cm. long, crenate-serrate to obliquely lobed, sessile or adnate-decurrent at base.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to Peru, Bolivia, and Brazil.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Montane rain forests at middle elevations.

LINDSAEA Dryander ex Smith

Lindsaea Dryander ex Smith in Mém. Acad. Turin 5: 401. 1793.

Figure 18.

Rhizome creeping or slightly ascending, clothed with scales both broad and very narrow or hairlike, the two types intermingled. Fronds closely attached or remote; stipes always dark at the base. Blades simple or variously subdivided; ultimate divisions usually dimidiate; pinnae having their chief vein along the lower (basiscopic) margin. Sori terminal on the veins or on a vascular commissure connecting the ends of two or more veins; indusium semiovate to linear, attached at the base or (when elongate) also along part of the sides, opening toward the margin. Sporangia with annulus of 7–15 cells; spores trilete or monolete.

Type species: *Lindsaea trapeziformis* Dryander, now correctly known as *L. lancea* (L.) Bedd.

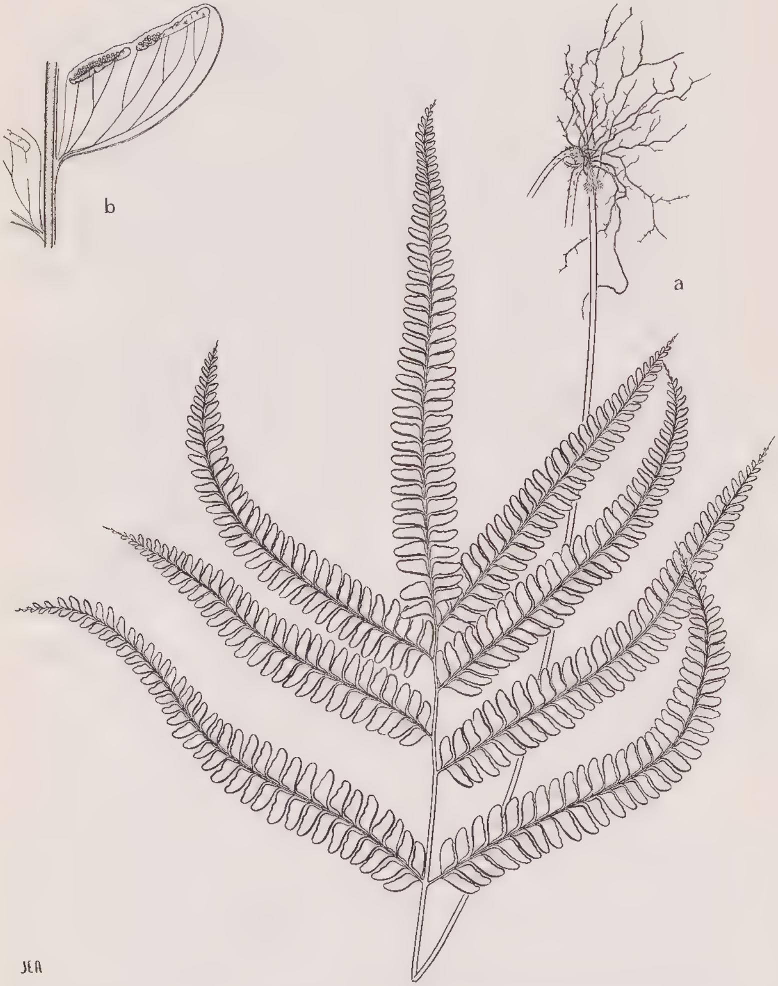

FIGURE 18. **Lindsaea.** a, b, *L. quadrangularis* subsp. *antillensis*: a, habit, × 0.4; b, enlarged fertile pinnule, showing venation and sori, × 2.4.

A pantropical genus of more than 200 species, five of these occurring in the Lesser Antilles. All are found in moist forests or margins of savannas at middle elevations.

SPECIAL LITERATURE: Kramer, A revision of the genus *Lindsaea* in the New World with notes on allied genera, in Acta Bot. Neerl. **6**: 97–290, *figs. 1–92*. 1957.

KEY TO THE SPECIES

a. Stipes terete (not grooved); primary rhachis above, and secondary rhachises on both sides, with pale lateral wings .... 1. *L. divaricata*
a. Stipes angled or grooved; rhachises not winged (slightly wing-angled in *L. lancea*.
  b. Terminal segment relatively large, deltate, free or nearly so; upper pinnules not much reduced.
    c. Tips of at least some of the pinnules prolonged, pointing obliquely upward, these pinnules with a diagonal main vein .. 2. *L. l'herminieri*
    c. Tips of pinnules not prolonged, the main vein never diagonal .... 3. *L. lancea*
  b. Terminal segment relatively small, connected by decurrent wings with the gradually reduced and confluent upper pinnules.
    d. Secondary rhachises grooved beneath .... 4. *L. quadrangularis*
    d. Secondary rhachises mostly not grooved beneath ... 5. *L. guianensis*

1. **Lindsaea divaricata** Klotzsch in Linnaea **18**: 547. 1844.

Type: *Schomburgk 368*, from Guyana (formerly British Guiana) (B).

Rhizome 2–2.5 mm. in diameter, bearing lanceolate, long-acuminate scales up to 1.4 mm. long and 0.2 mm. wide; stipes 10–60 cm. long, terete, dark brown to almost black, shining, narrowly winged above. Blade bipinnate, with mostly 3–5 pairs of pinnae; primary rhachis usually reddish-brown, shining; pinnae mostly 12–25 cm. long; pinnules 15–30 pairs, mostly 10–20 mm. long and 4–8 mm. wide, alternate, the apical one reduced to an acute, triangular-lanceolate terminal segment, the veins mostly twice-forked. Spores mostly ca. 23–28 μ. in diameter.

GENERAL DISTRIBUTION: Continental tropical America from Guatemala to Bolivia, Paraguay, and Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe (very rare).

HABITAT: Terrestrial in moist forests at lower elevations.

2. **Lindsaea l'herminieri** Fée, Mém. Fam. Foug. **11**: 15, *t. 6, fig. 1.* 1866.

Type: *L'Herminier s.n.*, from Guadeloupe (B).
Syn.: *Lindsaea trapeziformis* var. *l'herminieri* (Fée) Krug in Engl. Bot. Jahrb. **24**: 91. 1897.

Rhizome 2–2.5 mm. in diameter, bearing lanceolate, long-acuminate scales up to 1.2 mm. long, 0.2 mm. wide; stipes 20–27 cm. long, straw-colored, quadrangular. Blade bipinnate (rarely once-pinnate), mostly 18–40 cm. long, with 1–3 pairs of pinnae; pinnae 10–25 cm. long; pinnules 10–30 pairs, more or less rhombic and usually with a protracted apex, 20–35 mm. long (measured along lower margin), 7–12 mm. broad, the upper margin crenate (when sterile) or sinuate (when fertile), the inner veins once- or twice-forked, the outer ones simple. Spores 23–30 μ. in diameter.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe (very rare).

Habitat: Terrestrial in moist forests at lower to middle elevations.

3. **Lindsaea lancea** (L.) Bedd., Ferns Brit. India Suppl. 6. 1876.

Basionym: *Adiantum lancea* L., Sp. Pl. ed. 2, 2: 1557. 1763.
Type: Seba, Thes. 2, *t. 64, figs. 7, 8,* based on material from Surinam.
Syn.: *Lindsaea trapeziformis* Dryander in Trans. Linn. Soc. London 3: 43, *t. 9.* 1797. (Type from Grenada.)
Lindsaea falcata var. *lancea* (L.) Jenman, Ferns Br. W. Ind. & Guiana 74. 1899.

Rhizome often long-creeping, 1.5–3 mm. in diameter, bearing narrowly lanceolate scales up to 2 mm. long and 0.2 mm. wide. Fronds occurring in two forms, 1-pinnate or 2-pinnate, taxonomically linked by numerous intergrades; stipes 7–22 cm. long (in 1-pinnate fronds) or 10–50 cm. long (in 2-pinnate fronds), dark purplish-brown at least toward the base, more or less angular. Bipinnate blades 11–52 cm. long (once-pinnate blades 6–30 cm. long), with mostly 3–4 pinnae on each side, these alternate; primary rhachis grooved and sharply wing-angled. Pinnules mostly subtrapezoidal; inner margin straight and parallel to the rhachis; lower (basiscopic) margin often concave; upper (acroscopic) margin rounded at the outer end and ofter straight in the midportion, the upper sterile margins crenate, the upper fertile margins entire; veins mostly twice-forked. Spores trilete, 22–25 μ. long.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to South America. Several more or less distinct varieties occur in South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Grenada.

Habitat: Terrestrial in moist forests at low to medium elevations.

4. **Lindsaea quadrangularis** Raddi in Opusc. Sci. Bol. 3: 294. 1819. subspecies **antillensis** Kramer in Acta Bot. Neerl. 6: 194. 1957.

Type: *Eggers 647*, from "Roseau-lagoon," Dominica (B).
Syn.: *Lindsaea montana* Fée, Mém. Fam. Foug. 11: 17. 1866, in part. (Type from Guadeloupe.)

Lindsaea lancea f. *montana* (Fée) Lindman in Ark. Bot. 1: 198. 1903, with regard to type only.
Lindsaea lancea var. *montana* (Fée) Bonaparte, Notes Pter. 7: 343. 1918.

Rhizome 1.5–3 mm. in diameter, bearing lanceolate scales 1.5–2 mm. long and 0.3–0.4 mm. wide; stipes 15–40 cm. long, brown at base, grooved. Blades 2-pinnate, with 1–4 pairs of subopposite to alternate pinnae, these 9–25 cm. long; pinnules in 15–40 pairs, subopposite to alternate, varying in size and shape, mostly 12–18 mm. long, 5–8 mm. wide, tongue-shaped or rounded-subrhomboid, the veins forked once or twice; rhachis grooved beneath. Spores ca. 28 μ. long.

General Distribution: Puerto Rico, Venezuela; other subspecies of *L. quadrangularis* occur in Central and South America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Terrestrial in moist forests at medium elevations.

5. **Lindsaea guianensis** (Aubl.) Dryander in Trans. Linn. Soc. London 3: 42. 1797.

Basionym: *Adiantum guianense* Aubl., Hist. Pl. Guian. 2: 963, 4: *t. 365.* 1775. Type: *Aublet*, from French Guiana.

Rhizome 3–4 mm. in diameter, bearing long-acuminate scales up to 1.2 mm. long, 0.2 mm. wide; stipes 10–60 cm. long, brown to blackish at base, grooved. Blades 2-pinnate, 20–65 cm. long, pinnae usually 4–7 pairs, subopposite to alternate, 10–25 cm. long, sometimes long-attenuate at the apex; pinnules numerous, 30–70 pairs, (8–)10–12 mm. long and (3–)5–7 mm. wide, dimidiate-ovate, the apex obtuse or subacute, the veins once- or twice-forked. Spores 18–25 μ. long.

General Distribution: Nicaragua, South America.

Distribution in Lesser Antilles: Guadeloupe, St. Vincent, Grenada; very rare.

Habitat: Terrestrial in moist forests at low to medium elevations.

ORMOLOMA Maxon

Ormoloma Maxon in Proc. Biol. Soc. Wash. 46: 143. 1933.

Figure 19.

Terrestrial ferns of rain forests. Rhizome long-creeping, clothed with ovate or lanceolate scales. Fronds scattered; stipe and rhachis dark brown. Blades 1-pinnate, with a conform terminal pinna; pinnae nonarticulate; nearly equilateral, with a median primary vein and free, forking lateral veins. Sori terminal on the veins; indusium semicircular or

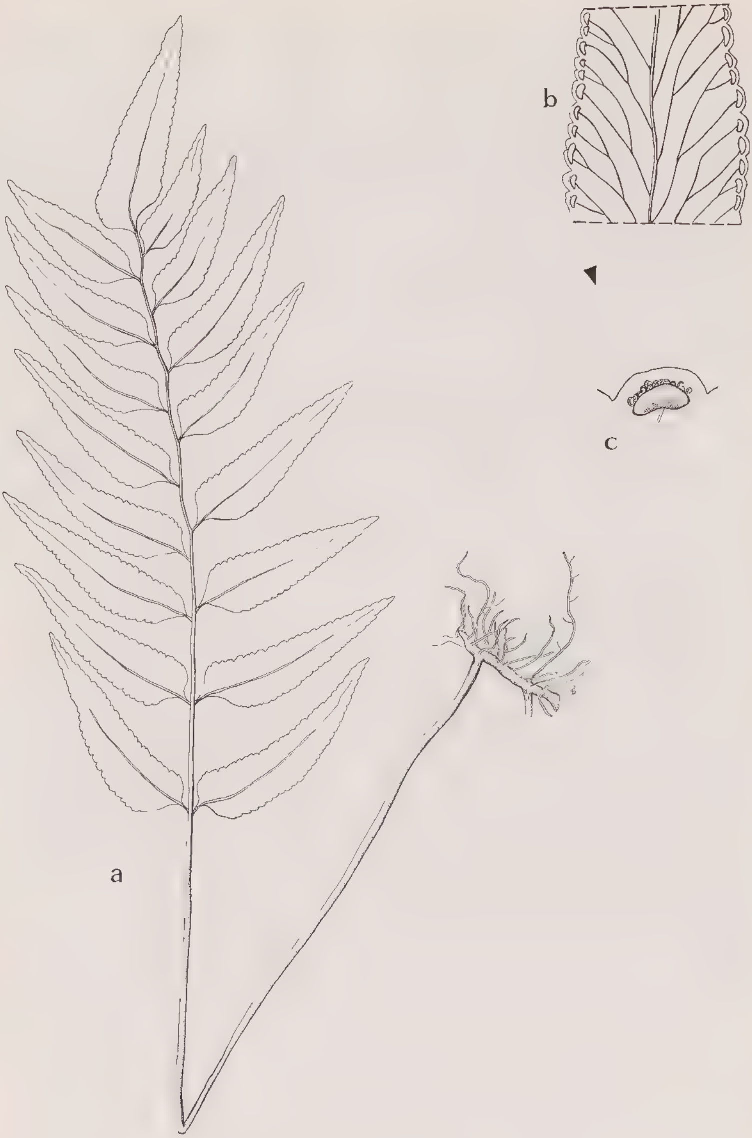

FIGURE 19. **Ormoloma.** a–c, *O. imrayanum*: a, habit, × 0.5; b, segment of fertile pinna, showing venation and sori, × 1.5; c, sorus, showing semi-ovate indusium opening toward margin, × 5.0.

semiovate, attached at base but otherwise free, opening toward the margin. Sporangia with annulus of 10–14 cells; spores trilete.

Type species: *Ormoloma imrayanum* (Hook.) Maxon, based on *Saccoloma imrayana* Hook. of the West Indies and the Guianas. Only one other species (a native of Costa Rica and Panama) is known.

Special literature: Kramer, A revision of the genus *Lindsaea* in the New World with notes on allied genera, in Acta Bot. Neerl. **6**: 276–278. 1957.

1. **Ormoloma imrayanum** (Hook.) Maxon in Proc. Biol. Soc. Wash. **46**: 144. 1933.

Basionym: *Saccoloma imrayana* Hook. in Kunze, Farrnkr. **1**: 86. 1841, 1842.
Type: *Imray 84*, from Couliaban Mt. (= Morne Anglais ?), Dominica (K).
Syn.: (This species has also been assigned to the genera *Davallia*, *Humata*, *Acrophorus*, *Schizoloma*, and *Lindsaea* by various authors.)

Rhizome 1–2.5 mm. in diameter, the scales lanceolate, up to 2.5 mm. long and 0.6 mm. broad; stipes deep purple to blackish, 10–30 cm. long, grooved. Blades 9–36 cm. long, ca. 10 cm. broad, with 2–10 pairs of pinnae; pinnae lanceolate, slightly inequilateral at base, short-stalked, with crenate margins. Spores 27–30 μ. long.

General Distribution: Hispaniola, the Guianas.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: Terrestrial in rich wet forests at middle to higher elevations.

ODONTOSORIA (C. Presl) Fée

Odontosoria (C. Presl) Fée, Mém. Fam. Foug. **5**: 325. 1852.
Figure 20.

Basionym: *Davallia* sect. *Odontosoria* C. Presl, Tent. Pter. 129. 1836, in part.

Terrestrial ferns with scandent fronds. Rhizomes slender, wide-creeping, densely clothed with slender, hairlike scales. Fronds of indeterminate growth, 2- to 4-pinnate; primary divisions opposite; ultimate pinnules small and variously lobed or cleft; stipe and rhachis woody, flexuous, and usually spiny. Sori terminal on single veins, immersed in tissue; indusium joined to the opposed frond lobule to form an urceolate involucre.

Type species: *Odontosoria uncinella* (Kunze) Fée, based on *Davallia uncinella* Kunze, of the Greater Antilles (except Jamaica).

A small genus of 10 species, all native to tropical America; a single one known from the Lesser Antilles.

Special literature: Maxon, The genus *Odontosoria*, in Contr. U. S. Nat. Herb. **17**(2): 157–168, *4 plates*. 1913.

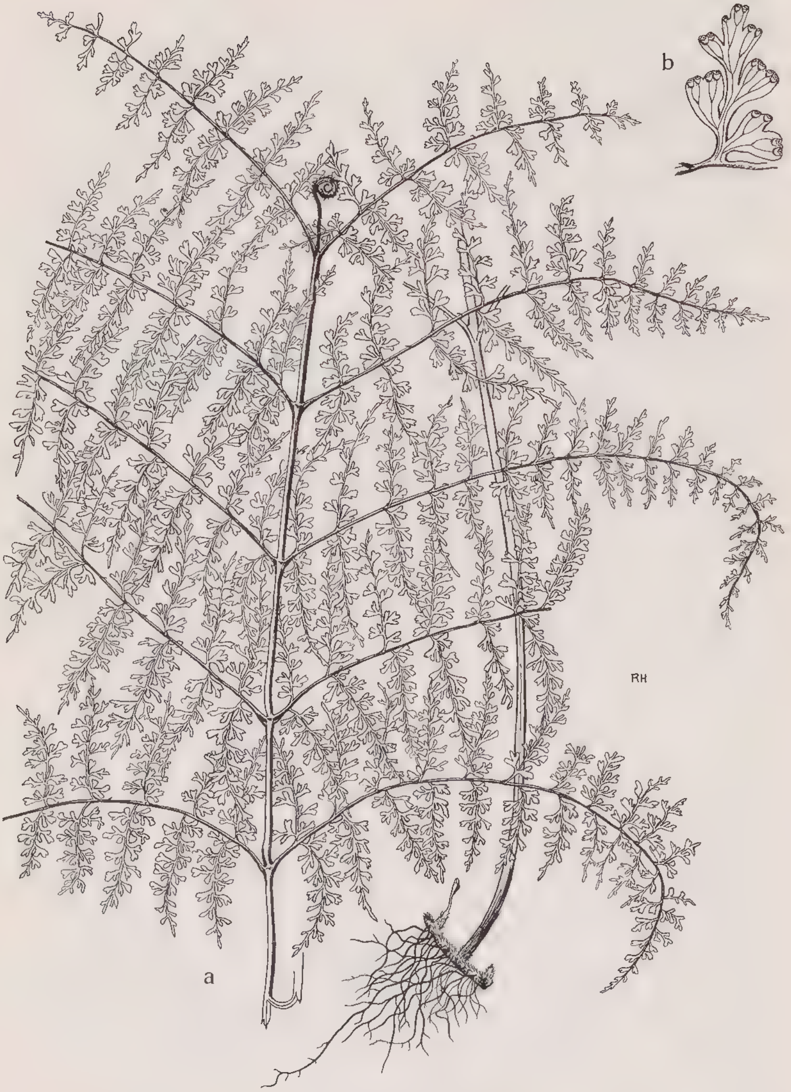

FIGURE 20. **Odontosoria.** a, b, *O. flexuosa*: a, sections of rhizome, stipe, and frond, × 0.4; b, pinnule, showing venation and sori, × 2.6.

1. **Odontosoria flexuosa** (Sprengel) Maxon in Contr. U. S. Nat. Herb. 17(2): 163. 1913.

Basionym: *Davallia flexuosa* Sprengel ex Kunze in Bot. Zeit. 8: 213. 1850.
Type: *Kohaut, Sieber Fl. Mart. Suppl. 23,* collected in Martinique.
Syn.: *Davallia aculeata* sensu Hook., Sp. Fil. 1: 190, *t 54-b.* 1846, in part, with regard to plate, but not *Odontosoria aculeata* (L.) J. Smith, 1857.
Davallia aculeata sensu Griseb., Fl. Br. W. Ind. 662. 1864, in part, but not *Odontosoria aculeata* (L.) J. Smith, 1857.
Microlepia flexuosa (Sprengel) Ettingsh., Farnkr. Jetztw. 208. 1865.

Rhizome ca. 3 mm. in diameter, the lance-attenuate scales 1–2 mm. long and ca. 0.2 mm. broad, clathrate; stipes smooth, red-brown, 15–20 cm. long. Primary rhachis usually red-brown, angled, relatively straight, with few, minute spines mostly occurring on secondary and tertiary rhachises. Blades 4-pinnate; ultimate pinnules or lobes obdeltate or subrhombic, cuneate at base, 1- to 3-notched or -cleft, with veins impressed above, raised beneath and margins somewhat thickened.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent.

HABITAT: Thickets, bushy pastures, and steep wooded banks at chiefly medium elevations.

Subfamily PTERIDOIDEAE

KEY TO THE SPECIES

a. Rhizome bearing hairs but not scales.
  b. Stipe and rhachis spiny .... 6. *Hypolepis*
  b. Stipe and rhachis not spiny.
    c. Veins all free.
      d. Rhizome succulent, green; fronds hairy on both sides; margins not revolute .... 7. *Anisosorus*
      d. Rhizome woody, wide-creeping, deep in the ground; fronds glabrous on upper side at least; margins strongly revolute .... 8. *Pteridium*
    c. Veins reticulate .... 9. *Lonchitis*
a. Rhizome with scales (hairs also may be present).
  e. Sporangia in linear marginal sori with distinct indusium.
    f. Rhizome wide-creeping, the fronds distant; blades glaucous; pinnae with stipulelike basal lobes .... 10. *Histiopteris*
    f. Rhizome short, decumbent to erect, the fronds clustered (if otherwise, fronds 1-pinnate only); blades not glaucous; stipulelike lobes absent .... 11. *Pteris*
  e. Sporangia not strictly marginal, partially or completely covering underside of the pinnae.
    g. Margins with a narrow reflexed indusium; paraphyses absent; plants of wet glades in submontane forests .... 12. *Neurocallis*

g. Margins without trace of indusium; numerous paraphyses present among the sporangia; plants of saline or brackish swamps near the sea .... 13. *Acrostichum*

HYPOLEPIS Bernhardi

Hypolepis Bernh. in Neues J. Bot. Schrader 1(2): 34. 1806.

FIGURE 21.

Rather large terrestrial ferns. Rhizomes slender and wide-creeping, bearing pluricellular hairs but not scales. Fronds distant, often scandent and prickly; stipes stout, elongate, continuous with the rhizome. Blades 1- to 4-pinnate; ultimate segments lobed or pinnatifid, glabrous to densely hairy or viscid-glandular, the veins all free. Sori roundish, marginal or nearly so, solitary at the sinuses of the ultimate segments, often indusiate by the reflexure of a modified marginal crenature or lobule, thus opening inwardly. Sporangia with annulus of 13–15 cells.

TYPE SPECIES: *Hypolepis tenuifolia* (Forst.) Bernh., based on *Lonchitis tenuifolia* Forst., of the region from New Zealand to southeastern China.

A pantropical genus of about 45 species, one occurring in the Lesser Antilles.

1. **Hypolepis repens** (L.) C. Presl, Tent. Pter. 162. 1836.

Basionym: *Lonchitis repens* L., Sp. Pl. 2: 1078. 1753.

Lectotype: Plumier, Tr. Foug. *t. 12*, based on a plant from Martinique ("le mont Noël, & montant le Morne de la Calebasse").

Syn.: *Dicksonia aculeata* Sprengel in Neue Entd. 3: 7. 1822. (Syntypes from St. Lucia and Martinique.)
Hypolepis aculeata (Sprengel) J. Smith in J. Bot. Hook. 4: 157. 1841.
Hypolepis delicatula Fée, Mém. Fam. Foug. 11: 28, *t. 21, fig. 1.* 1866. (Type from Guadeloupe.)

Rhizome woody, 3–5 mm. in diameter. Fronds ascending or arching, subscandent, up to 5 or 6 m. long; stipes purple-brown at base, paler above; both stipe and rhachis beset with numerous straight sharp spines, these up to 2.5 mm. long. Blades deltate-elongate, 3-pinnate-pinnatifid, up to 1.5 m. broad at the base; pinnae spreading, lance-deltate, 20–50 cm. broad, stalked; tertiary divisions (pinnules) deeply pinnatifid, the lobes or segments oblong, rounded, or subtruncate, lightly crenate, glabrous or bearing a few distant hairs. Sori with distinct thin, white, subentire indusia.

GENERAL DISTRIBUTION: Florida, Cuba, Puerto Rico, Tobago, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia.

HABITAT: Moist thickets in secondary rain forest areas at middle elevations.

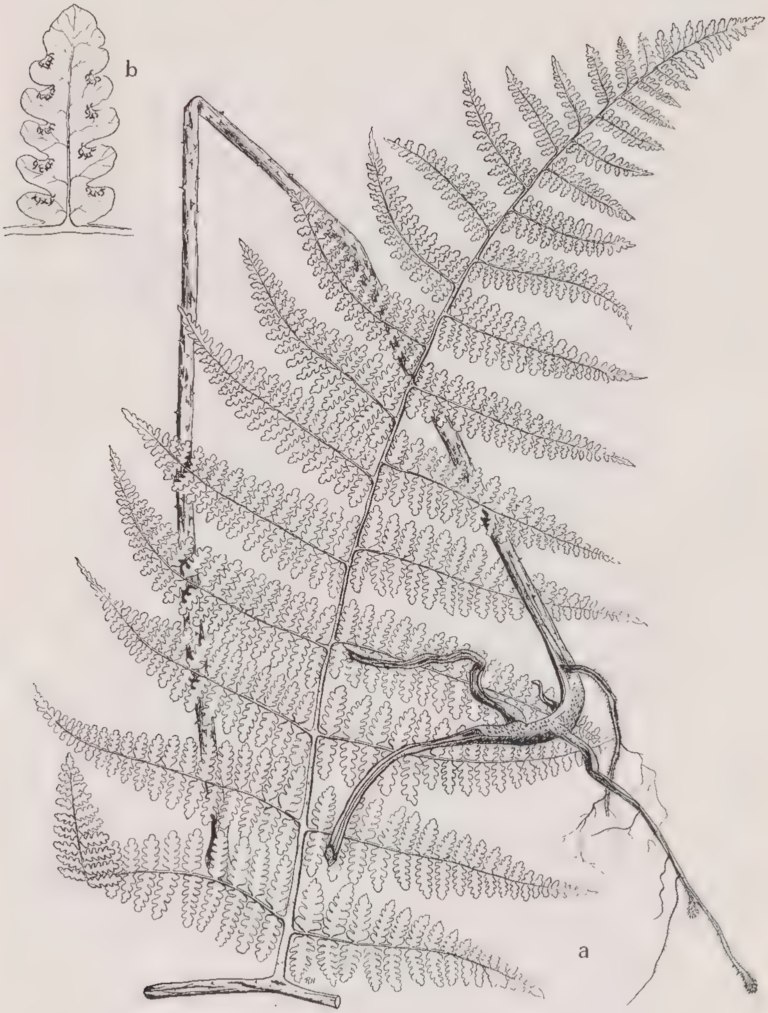

FIGURE 21. **Hypolepis.** a, b, *H. repens*: a, sections of rhizome, stipe, and frond, × 0.4; b, pinnule, showing venation and sori, × 2.6.

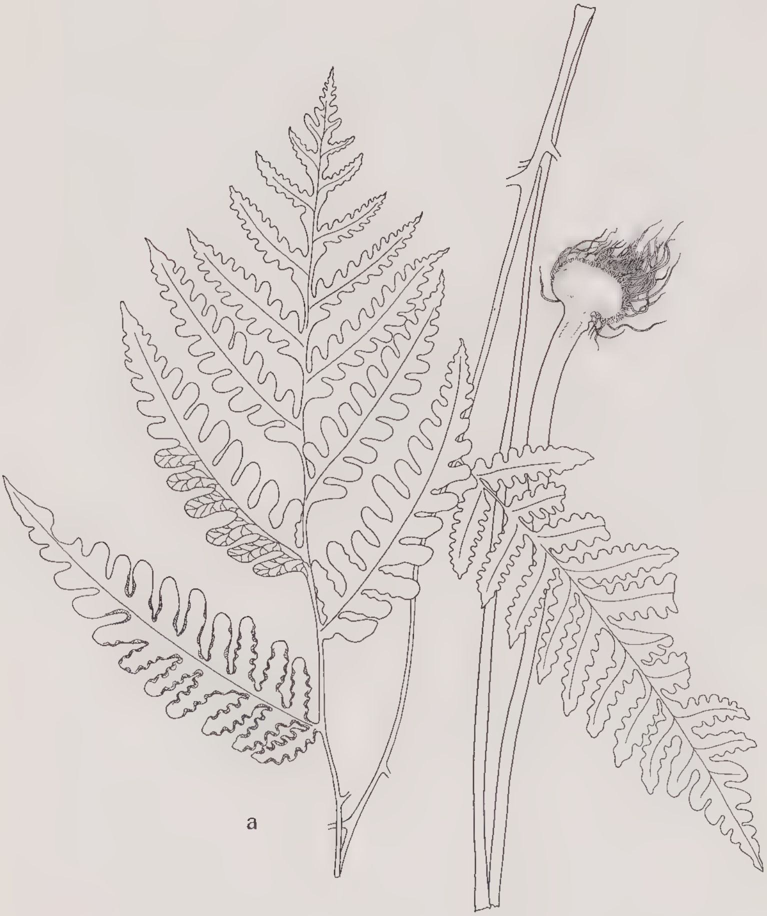

Figure 22. **Anisosorus.** a, *A. hirsutus*, habit, showing free venation and sori (borne between the sinus and apex of segments), × 0.4.

ANISOSORUS Trevisan

Anisosorus Trev. in Atti Ist. Veneto II, 2: 166. 1851. FIGURE 22.

Syn.: *Lonchitis* L., Sp. Pl. 2: 1078. 1753, in part; R. Tryon in Contr. Gray Herb. **191**: 94. 1962.

Medium to rather large terrestrial ferns. Rhizomes somewhat succulent, green, short-creeping, bearing numerous colorless septate hairs but not true scales. Fronds few (produced singly), hairy, succulent; stipe with 2 vascular bundles near the base. Blades coarsely 2-pinnate-pinnatifid; rhachis with lateral ridges continuous beneath, not interrupted at insertion of the pinnae; pinnae with veins free or (rarely) casually areolate. Sori marginal, usually borne between the sinus and apex of the segments; indusium arising from the inner edge of a marginal flange. Spores tetrahedral-globose, trilete, scarcely marked.

TYPE SPECIES: *Anisosorus hirsutus* (L.) L. M. Underw. & Maxon, based on *Lonchitis hirsuta* L., widespread in the American tropics. Another species is said to occur in tropical Africa and Madagascar.

1. **Anisosorus hirsutus** (L.) L. M. Underw. & Maxon ex Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 429. 1926.

Basionym: *Lonchitis hirsuta* L., Sp. Pl. 2: 1078. 1753.
Lectotype: Plumier, Tr. Foug. *t. 20*, based on a plant from Morne Rouge, Martinique.
Syn.: *Pteris laciniata* Willd. in L., Sp. Pl. **5**: 397. 1810; Griseb., Fl. Br. W. Ind. 669. 1864. (Type: *Herb. Willd. 20013*, from an unknown locality (B).)
Pteris hirsuta (L.) J. Smith in J. Bot. Hook. **4**: 165. 1841, not Poiret in Lam., 1804.
Antiosorus hirsutus (L.) Kuhn, Gruppe Chaet. 27. 1882.
Lonchitis aurita sensu R. Tryon in Contr. Gray Herb. **191**: 95. 1962, not L., 1753.

Fronds 1–2.5 m. long; stipes stout, pale green, hollow, shorter than the blades. Blades hairy throughout, the hairs whitish and pluricellular; pinnae few, subopposite to alternate, stalked, ovate-oblong to unequally deltate, the lowest ones the largest; ultimate segments more or less rounded-oblong, 5–9 mm. broad, lobed or nearly entire.

GENERAL DISTRIBUTION: Greater Antilles, continental tropical America from Mexico to Bolivia.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Lucia, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Moist shaded banks, especially along watercourses in sheltered ravines at medium elevations.

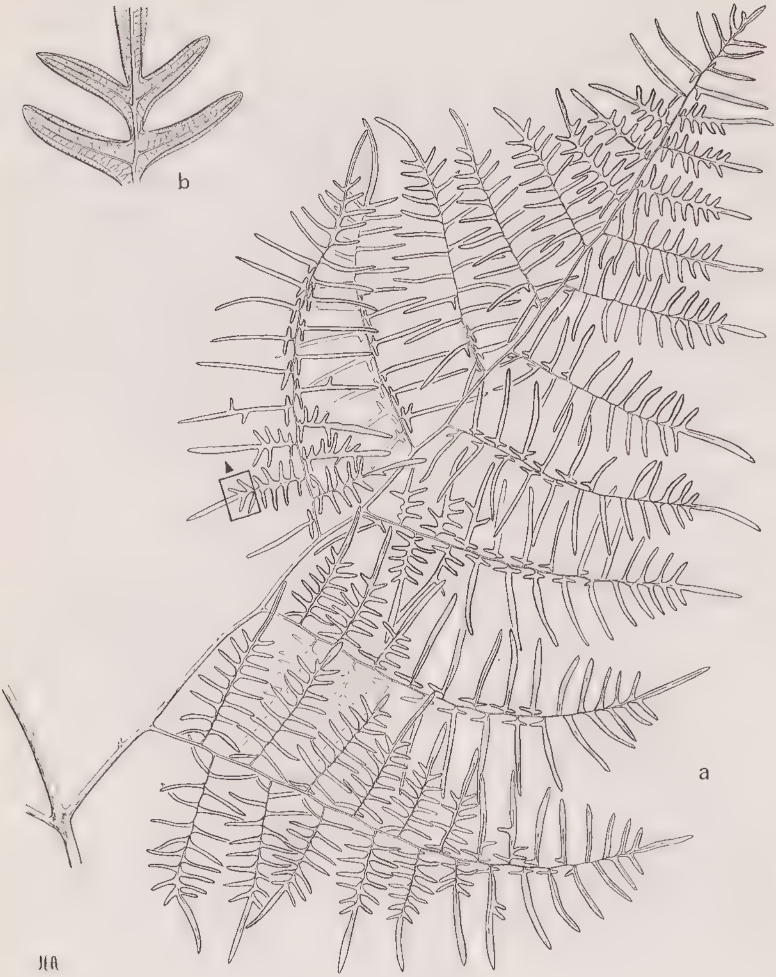

FIGURE 23. **Pteridium.** a, b, *P. aquilinum* var. *caudatum*: a, basal pinna, × 0.4; b, section of ultimate segment (inside box) showing venation and continuous marginal sori, × 2.4.

PTERIDIUM Gleditsch ex Scopoli

Pteridium Gled. ex Scop., Fl. Carn. ed. 1, 169. 1760, nom. cons.
FIGURE 23.

Weedy terrestrial ferns. Rhizomes subterranean, extensively creeping, repeatedly branched, clothed toward the apex with reddish-brown, pluricellular, articulate hairs. Fronds of medium to rather large size, usually of coarse, hard texture, mostly 3- or 4-pinnate, the lower pinnae with glandular "nectaries" at base when young; ultimate segments variable in size and shape but always with revolute margins, the veins all free. Sori marginal usually continuous, the sporangia borne between an outer "false" indusium (the reflexed modified margin of the segment) and an inner one of variable structure, on a vascular strand connecting the vein ends; paraphyses absent. Sporangia with annulus of ca. 13 cells; spores tetrahedral-globose, very finely spinulose.

TYPE SPECIES: *Pteridium aquilinum* (L.) Kuhn, based on *Pteris aquilina* L., a greatly variable species of worldwide distribution. Two varieties occur in the Lesser Antilles.

SPECIAL LITERATURE: R. Tryon, Revision of the genus *Pteridium*, in Contr. Gray Herb. **134**: 1–70. 1941. (reprinted from Rhodora **43**: 1–31, 37–67, *t. 650–653.* 1941).

1. **Pteridium aquilinum** (L.) Kuhn in von der Decken, Reisen in Ost-Afrika 3(3): 11. 1879.

The typical variety of this species does not occur in the Lesser Antilles. The Lesser Antillean varieties can be distinguished as follows:

a. Free lobes absent from the rhachis, costae, and costules; midvein on lower surface of the ultimate segments usually glabrous ...... var. *caudatum*
a. Free lobes present on the rhachis, costae, and costules, these alternating with normal divisions; midvein on lower surface of the ultimate segments usually dark-pubescent .... var. *arachnoideum*

1a. **Pteridium aquilinum** var. **caudatum** (L.) Sadebeck in Jahrb. Hamb. Wiss. Anst. 14(Beiheft 3): 5. 1897, with regard to name.

Basionym: *Pteris caudata* L., Sp. Pl. **2**: 1075. 1753.
Type: LINN *1246.15*, a specimen from the West Indies without exact locality. Linnaeus cited "Jamaicae, Dominicae saxosis," but these localities were probably derived from cited literature and not necessarily from the specimen. "Dominicae" probably referred to Hispaniola (Santo Domingo) rather than the island of Dominica.
Syn.: *Pteridium caudatum* (L.) Maxon in Proc. U. S. Nat. Mus. **23**: 631. 1901.

This variety tends to be smaller than var. *arachnoideum*, with usually greenish to stramineous stipes.

GENERAL DISTRIBUTION: Florida, Bermuda, Greater Antilles, Central America, northern South America.

Distribution in Lesser Antilles: Antigua, Montserrat.

Habitat: Pastures, old fields, and open banks at lower to medium elevations.

1b. **Pteridium aquilinum var. arachnoideum** (Kaulf.) Herter in Rev. Sudam. Bot. **5**: 21. 1937.

Basionym: *Pteris arachnoidea* Kaulf., Enum. Fil. 190. 1824.
Type: *Chamisso*, from Brazil.
Syn.: *Pteridium arachnoideum* (Kaulf.) Maxon in J. Wash. Acad. Sci. **14**: 89. 1924.

This variety tends to be larger and more robust than var. *caudatum*, with very stout, almost woody stipes which are often orange.

General Distribution: Greater Antilles, Trinidad, Central and South America.

Distribution in Lesser Antilles: St. Lucia, *Howard 11552* (A, IJ).

Habitat: Steep, open hillside, "exposed to sulfur fumes" (from sole native record).

LONCHITIS Linnaeus

Lonchitis L., Sp. Pl. 2: 1078. 1753. Figure 24.

Syn.: *Blotiella* R. Tryon in Contr. Gray Herb. **191**: 96. 1962.

Medium to large terrestrial ferns. Rhizomes woody, ascending to erect, bearing numerous septate hairs but no scales. Fronds usually hairy; stipe containing a single bent or contorted vascular bundle. Blades 1- to 3-pinnate, deltate in outline, the pinnae stalks decurrent into ridges on the rhachis, the veins reticulate. Sori marginal, short (rarely elongate), often located near the base of lobes or around the base of sinuses; indusium broad, membranous, formed by the reflexed modified frond margin. Sporangia borne on a delicate veinlet connecting the vein ends; spores bilateral, reniform, monolete, usually papillose.

Type species: *Lonchitis aurita* L., of scattered localities in tropical America.

A small genus of 10 or more species, found chiefly in Africa. Only the type species has been recorded from the Lesser Antilles.

1. **Lonchitis aurita** L., Sp. Pl. 2: 1078. 1753.

Lectotype: Plumier, Tr. Foug. *t. 17*, based on a plant from Prescheur District, Martinique.
Syn.: *Lonchitis lindeniana* Hook., Sp. Fil. **2**: 56, *t. 89-a*. 1851. (Type from Venezuela.)

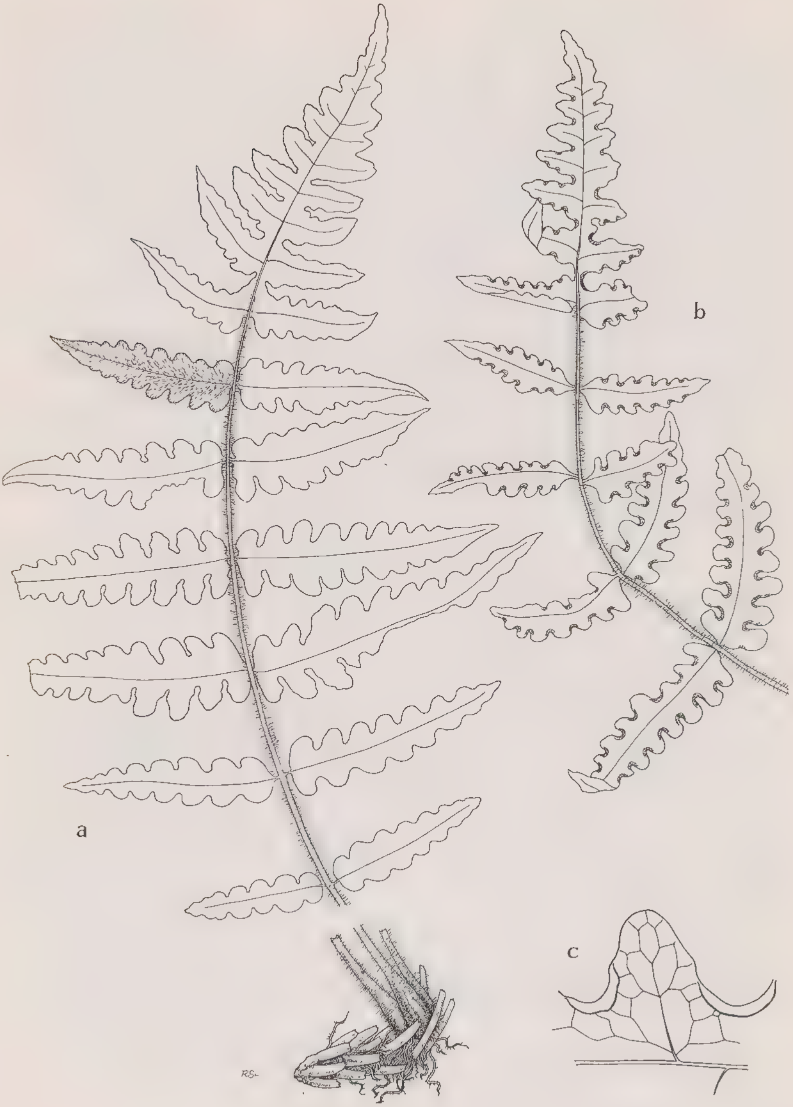

FIGURE 24. **Lonchitis.** a–c, *L. aurita*: a, section of sterile pinna, with a portion of the rhizome below, both × 0.4; b, section of frond showing marginal sori, × 0.4; c, enlarged lobe of pinna, showing venation and sori located at the base of sinuses, × 2.4.

Blotiella lindeniana (Hook.) R. Tryon in Contr. Gray Herb. **191**: 99. *figs. 5, 6.* 1962.

Rhizome woody, stout, ascending or nearly upright, densely hairy at the apex. Fronds 1–5 m. long; stipes about half as long as the blades, thick, densely golden-hairy, and beset with small, mostly blunt, blackish spines, these formed from thickened hair bases. Blades elongate-deltate, coarsely pinnate-pinnatifid (or 2-pinnate at base), hairy throughout, the hairs whitish, pluricellular; pinnae spreading, subopposite to alternate, nearly sessile; ultimate segments oblong to oblong-deltate, mostly acute, 15–23 mm. broad, nearly entire to crenate or shallowly lobed.

General Distribution: Jamaica, Costa Rica, northern South America.

Distribution in Lesser Antilles: Martinique, known only from the lectotype.

Habitat: Mossy montane rain forest at medium to higher elevations.

The rediscovery of this species in Martinique would be very interesting, and an effort should be made to locate it.

HISTIOPTERIS (J. G. Agardh) John Smith

Histiopteris (J. G. Agardh) J. Smith, Hist. Fil. 294. 1875. Figure 25.

Basionym: *Pteris* sect. *Histiopteris* J. G. Agardh, Rec. Spec. Gen. Pter. 76. 1839.

Terrestrial ferns with long-creeping rhizomes bearing numerous scales. Fronds distant, usually elongate and subscandent, of indefinite growth, glabrous; pinnae opposite, sessile, spreading, with stipulelike basal pinnules; tissue usually more or less glaucous, the veins reticulate, the areoles without included free veinlets. Sori marginal, continuous, the sporangia borne on a marginal connecting vein, protected by a scarious, reflexed indusium formed from the modified margin; paraphyses present. Sporangia with annulus of about 18 cells; spores bilateral, tuberculate.

Type species: *Pteris vespertilionis* Labill. (= *Histiopteris incisa* (Thunb.) J. Smith) of very wide distribution. The genus also includes a few Oriental species.

1. **Histiopteris incisa** (Thunb.) J. Smith, Hist. Fil. 295. 1875.

Basionym: *Pteris incisa* Thunb., Prodr. Pl. Cap. 171. 1800.
Type: *Thunberg*, from South Africa.
Syn.: *Litobrochia incisa* (Thunb.) C. Presl, Tent. Pter. 149. 1836.

Rhizome woody, 5–10 mm. thick, bearing numerous bright brown, lance-attenuate, clathrate scales, these chiefly at the apex, intermingled with abundant golden-brown hairs. Fronds 1–4 m. long; stipes short, shiny- or purple-brown, less than 1 m. long. Blades variable in dissection,

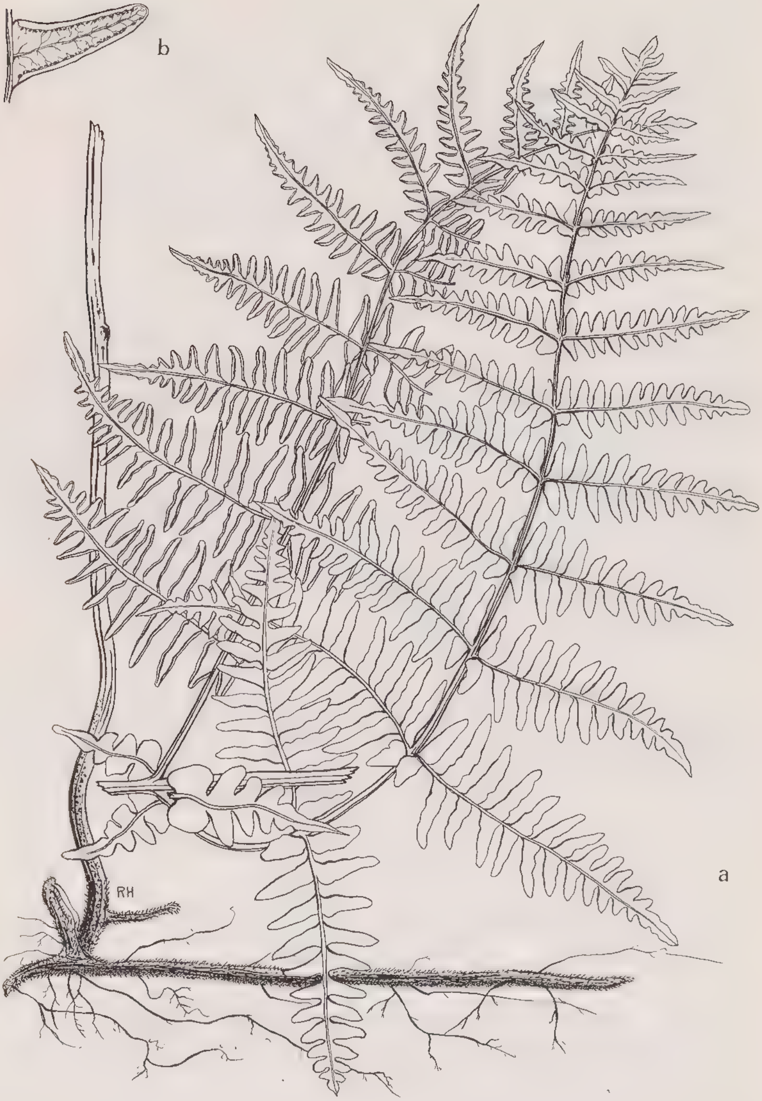

FIGURE 25. **Histiopteris.** a, b, *H. incisa*: a, sections of rhizome, stipe, and frond, × 0.4; b, enlarged ultimate segment, showing venation and continuous marginal sori, × 1.4.

2- to 4-pinnate (most often 2-pinnate-pinnatifid), up to 2 m. broad but usually less; ultimate segments rounded-obtuse and relatively broad in sterile blades, mostly elongate-deltate and acute if fertile.

General Distribution: Pantropical; also in south-temperate areas of South Africa, Tasmania, and New Zealand.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: Moist thickets and open banks at higher elevations.

PTERIS Linnaeus

Pteris L., Sp. Pl. 2: 1073. 1753. Figure 26.

Mostly rather coarse terrestrial ferns. Rhizomes often stout and woody, creeping to erect, clothed with scales at the apex. Fronds clustered, erect, usually not dimorphic. Blades 1- to 4-pinnate, elongate to ternate or pentagonal in outline; basal divisions often the largest, the venation free or areolate (sometimes only the basal veins joined). Sori usually linear, marginal, the sporangia borne in a continuous line on a delicate inframarginal vein connecting the ultimate vein ends; paraphyses usually present; indusium linear, formed by the modified reflexed margin, opening inwardly. Sporangia with annulus of 16–34 cells; spores tetrahedral or sometimes bilateral, smooth, tuberculate, or variously sculptured.

Type species: *Pteris longifolia* L. of the American tropics.

A large, worldwide genus of at least 280 species, most abundant in tropical regions. In the present book, 10 species are recognized as occurring in the Lesser Antilles, of which three are locally naturalized from sources in the Old World.

Key to the Species

a. Blades 1-pinnate, the pinnae not lobed or forked.
  b. Pinnae 5–15 cm. long, 3–10 mm. broad; veins all free.
    c. Pinnae articulate to the rhachis, spreading .... 1. *P. longifolia*
    c. Pinnae not articulate, often somewhat ascending or oblique .... 2. *P. vittata*
  b. Pinnae 20–45 cm. long, 15–50 mm. broad; veins areolate toward the margins .... 3. *P. grandifolia*
a. Blades 1- to 4-pinnate; if 1-pinnate, the pinnae (or some of them) forked or regularly lobed.
  d. Lower pinnae 2- or 3-forked, the divisions (and simple upper pinnae) linear, unlobed .... 4. *P. multifida*
  d. All pinnae deeply and regularly lobed or pinnatifid (if forked, the divisions also similarly lobed).
    e. Veins all free.
      f. Pinnae 2–5 pairs, the axils somewhat prickly; lowermost vein of each segment arising from the costa .... 5. *P. pungens*

    f. Pinnae 7–15 pairs, the axils not prickly; veins all arising from the costules . . . . 6. *P. quadriaurita*
  e. Veins (at least the basal pair) joined.
    g. Basal veins joined in a narrow costal arc . . . . 7. *P. biaurita*
    g. At least some other areoles present in addition to the costal arc.
      h. Ultimate segments less than 4 mm. broad . . . . 8. *P. tripartita*
      h. Ultimate segments more than 7 mm. broad.
        i. Veins 1-arcuate between costules; stipes of mature plant to 4 cm. thick . . . . 9. *P. arborea*
        i. Basal veins 2- or 3-arcuate between costules; stipes less than 1 cm. thick . . . . 10. *P. altissima*

1. **Pteris longifolia** L., Sp. Pl. 2: 1074. 1753.

Lectotype: Plumier, Descr. Pl. Amer. *t. 18* (= Tr. Foug. *t. 69*), based on a plant from near Port de Paix, Haiti.

Rhizome short-creeping, densely clothed with yellowish to rusty-brown, linear-deltate, hair-pointed scales. Fronds ascending or erect, mostly 30–100 cm. long; stipes straw-colored, shorter than the blades and densely scaly like the rhizome. Blades usually 8–25 cm. broad, oblong to lance-elliptic or oblanceolate, attenuate at base, acuminate at apex (or terminating abruptly in a linear segment); pinnae narrowly linear, the sterile ones 5–10 mm. broad, the fertile ones a little narrower, the bases cordulate (rarely hastulate), the narrowly scarious margins lightly crenulate-serrulate; tissue rigidly herbaceous, glabrate, the veins raised, translucent, mostly 1- or 2-forked. Indusium whitish, denticulate.

General Distribution: Greater Antilles, continental tropical America from Mexico to Brazil. A variety, sometimes treated as a separate species, also occurs in Florida, the Bahamas, and the Cayman Islands; this taxon apparently represents a diploid cytological race, whereas the other West Indian populations are all believed to be tetraploid.

Distribution in Lesser Antilles: Saba, St. Kitts, Guadeloupe; uncommon.

Habitat: Rocky banks and cliffs.

2. **Pteris vittata** L., Sp. Pl. 2: 1074. 1753.

Type: *Osbeck*, from China.
Syn.: *Pteris longifolia* sensu Duss, Foug. & Lyc. Antill. Franc. 66. 1903, in part, not L., 1753.
  ? *Pteris longifolia* var. *angusta* Christ ex Duss, Foug. & Lyc. Antill. Franc. 66. 1903.

Rhizome decumbent to erect, densely clothed with pale greenish to pale brownish, linear, hair-pointed scales to 5 mm. long. Fronds prostrate to ascending, mostly 20–100 cm. long; stipes pale brown, grooved, much shorter than the blades and densely clothed with pale, hairlike scales. Blades usually 6–25 cm. broad, oblanceolate to narrowly obovate, atten-

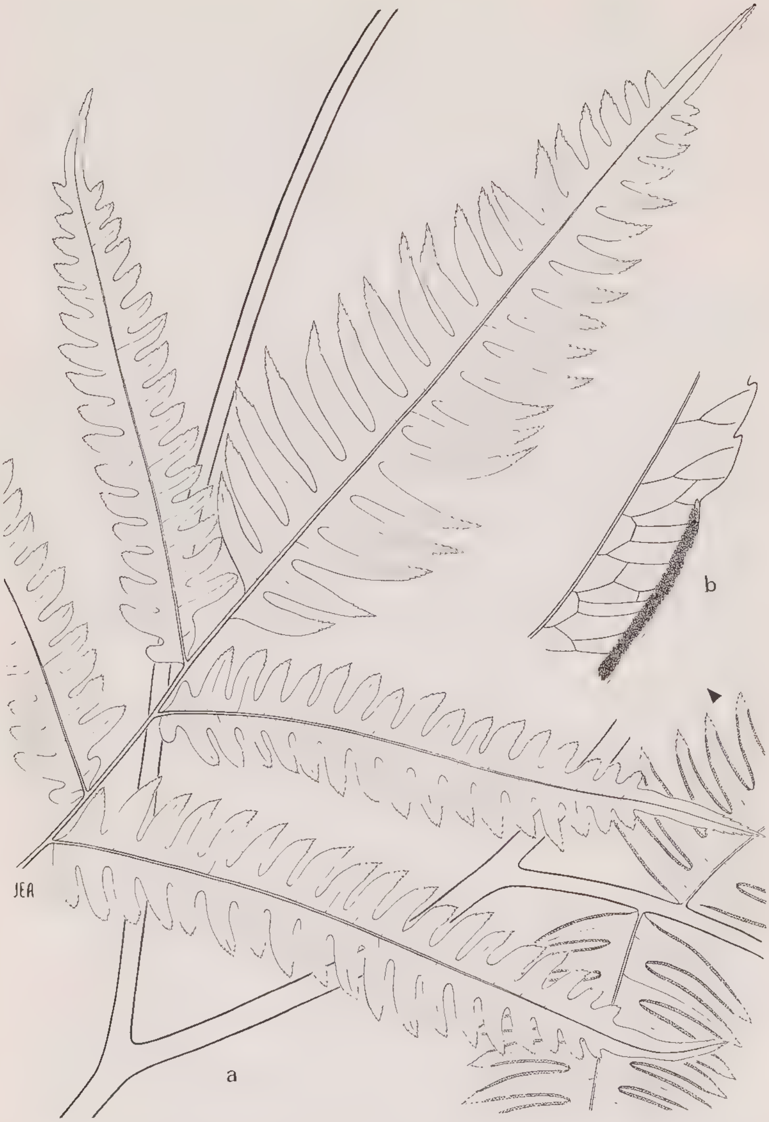

FIGURE 26. **Pteris.** a, b, *P. arborea*: a, section of blade, × 0.4; b, enlarged portion of fertile segment showing venation and linear, marginal sori, × 1.6.

uate at base, terminating abruptly in a linear pinna usually larger than the lateral ones; pinnae narrowly lance-linear, the bases often slightly dilated, the margins (where not soriferous) finely and sharply serrulate; tissue thin-herbaceous, glabrous, the veins raised, mostly 1-forked near base. Indusium greenish-brown, entire or slightly undulate.

General Distribution: Old World tropics; introduced and naturalized in Florida and southern United States, Virgin Islands, Trinidad, and perhaps in other localities.

Distribution in Lesser Antilles: Antigua, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, Grenada, Barbados.

Habitat: Chiefly on old walls and calcareous banks at lower elevations.

Several authors have (incorrectly) treated this species as not distinct from *P. longifolia.*

3. **Pteris grandifolia** L., Sp. Pl. 2: 1073. 1753.

Lectotype: Plumier, Tr. Foug. *t. 105*, which was based on material from Haiti, collected between Léogane and Petit Goave.

Syn.: *Litobrochia grandifolia* (L.) J. Smith in J. Bot. Hook. 4: 163. 1841.
Heterophlebium grandifolium (L.) Fée, Mém. Fam. Foug. 5: 140, *t. 11-A, figs. 9–12.* 1852.

Rhizome stout, creeping, bearing numerous thin, lance-attenuate, pale reddish-brown scales. Fronds more or less erect; stipes stout (to 1 cm. in diameter), straw-colored, terete, glabrate, about half as long as the blades. Blades narrowly oblong, 1–2 m. long, 35–75 cm. broad; rhachis deeply grooved; pinnae numerous, 2–6 cm. apart on either side, narrowly oblong-linear to linear-attenuate from a roundish or broadly cuneate base, 1.5–5 cm. broad, mostly subsessile (the lowermost ones short-stalked), escavate on lower (basiscopic) side, the margins entire and narrowly cartilaginous; tissue membrano-herbaceous, translucent, with veins mostly 1-forked below the middle, freely areolate beyond, with enlarged tips. Indusium translucent, minutely erose.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to Peru.

Distribution in Lesser Antilles: Guadeloupe, Grenada.

Habitat: Moist thickets, banks, and ravines at lower to middle elevations; plants rather rare.

4. **Pteris multifida** Poiret in Lam., Encycl. Méth. Bot. 5: 714. 1804.

Type: From a plant cultivated at the Museum d'Histoire Naturelle in Paris, of unknown origin.

Rhizome small, short, decumbent or erect, usually branched, bearing at the apex a tuft of glossy red-brown, lance-attenuate scales up to 3 mm. long, the margins often glandular. Fronds glabrous, somewhat dimorphic, 10–30(–50) cm. long; stipes slender, grooved, straw-colored, often as long as the blades. Blades ovate in outline, pedately 1-pinnate at base (the basal pinnae 1-forked, the lower segment shorter than the upper, both simple), pinnatisect above, with 1–2 pairs of simple, linear-attenuate lateral segments and a similar elongate terminal one; sterile segments to 12 mm. broad, with sharply serrulate, finely cartilaginous margins, fertile segments narrower (mostly 5 mm. broad or less), with entire margins, both sterile and fertile segments with thin-herbaceous tissue and simple to 1- or 2-forked veins. Indusium whitish, entire.

General Distribution: Tropical Asia; naturalized at scattered localities in the American tropics.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique.

Habitat: Crevices of old walls.

5. **Pteris pungens** Willd. in L., Sp. Pl. 5: 387. 1810.

Lectotype: Plumier, Tr. Foug. *t. 14*, based on a plant collected along the Grande Rivière, near Léogane, Haiti.

Syn.: *Pteris acuminata* Desvaux in Ges. Naturf. Freunde Berlin Mag. 5: 324. 1811.
Pteris biaurita var. *pungens* (Willd.) Christ in Engl. Bot. Jahrb. 24: 99. 1897.

Rhizome short, ascending, about 2 cm. thick, rather woody, densely clothed toward the apex with linear, glossy red-brown, denticulate, keeled scales. Fronds ascending, up to 1.4 m. long; stipes deeply grooved, minutely prickly, at least equalling the blades. Blades suborbicular to broadly pentagonal-oblong, up to 50 cm. broad; pinnae deeply pinnatifid, subsessile, the basal ones 2-partite, the others lanceolate to elliptic-linear, tapering at base, abruptly caudate at apex, 4–8 cm. broad near the middle; segments mostly linear, subfalcate, mostly 4–8 mm. broad, the lower ones evenly reduced, with veins mostly 1-forked. Indusium entire.

General Distribution: Greater Antilles except Cuba; Trinidad, continental tropical America from Mexico to Bolivia.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Moist rocky stream banks at middle elevations.

6. **Pteris quadriaurita** Retz., Obs. Bot. 6: 38. 1791.

Type: *König*, from Ceylon.

Syn.: *Pteris biaurita* var. *quadriaurita* (Retz.) Sw., Syn. Fil. 98. 1806.
? *Pteris nemoralis* Willd. in L., Sp. Pl. 5: 386. 1810, in part.

Pteris repandula Link, Fil. Hort. Berol. 56. 1841. (Type from Brazil.)
Pteris felosma J. Smith in Comp. Curt. Bot. Mag. **72**: 24. 1845. (Type from Jamaica.)
Pteris biaurita var. *repandula* (Link) Kuhn in Engl. Bot. Jahrb. **24**: 99. 1897.
Pteris biaurita f. *nemoralis* (Willd.) Duss, Foug. & Lyc. Antill. Franc. 68. 1903.

Rhizome erect or ascending, woody, densely clothed at apex with small, narrowly linear scales to 5 mm. long, these dark brown with pale, roughish margins. Fronds suberect, up to 1.5 m. long; stipes grooved, often nearly as long as the blades. Blades oblong, up to 50 cm. broad; pinnae mostly opposite, deeply pinnatifid, the basal pinnae 2-partite or occasionally with 2 elongate basiscopic pinnules, the other pinnae narrowly deltate-oblong, acuminate at the apex, and broader on the lower (basiscopic) side; segments linear to oblong, 1–3 cm. long, 3–6 mm. broad, straight or subfalcate, the basal segments not reduced; tissue thin- to firm-herbaceous, the veins mostly 1-forked. Indusium pale, translucent, entire.

General Distribution: Pantropical, if construed in the broad sense, and rather polymorphic. The typical population in Ceylon is cytologically distinct from the Antillean plants customarily known by the same name.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Martinique.

Habitat: Shaded banks and rocky forest glades at lower to medium elevations; plants not common.

7. **Pteris biaurita** L., Sp. Pl. 2: 1076. 1753.

Lectotype: Plumier, Descr. Pl. Amer. *t. 14* (= Tr. Foug. *t. 15*), which illustrates a plant from an unspecified locality, presumably either Martinique or Hispaniola.

Rhizome erect, woody, densely clothed at extreme apex with small, deltate-ovate scales up to 2 mm. long, these with glossy black, linear-deltate midrib and broad, delicate, pale brown, translucent, lacerate-ciliate margins. Fronds suberect, 0.7–1.5 m. long; stipes grooved, straw-colored, as long as the blades. Blades oblong or deltate-oblong, up to 40 cm. broad; pinnae 6–15 pairs, opposite, all but the 2-partite basal ones sessile, pinnatifid, narrowly oblong-lanceolate to lance-attenuate, broader on the basiscopic side; segments narrowly oblong to linear, 1–3 cm. long, 3–5 mm. broad at the middle; tissue thin-herbaceous, translucent, with free, mostly 1-forked veins. Indusium translucent, entire.

General Distribution: Pantropical.

Distribution in Lesser Antilles: Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique.

HABITAT: Shaded rocky banks and hillsides at lower to middle or higher elevations.

8. **Pteris tripartita** Sw. in J. Bot. Schrader 1800(2): 67. 1801; Syn. Fil. 100, 293. 1806.

Type: *Thunberg*, from Java.

Rhizome short, erect, bearing at the apex small (to 3 mm. long), thin, light brown scales. Fronds tripartite, glabrate, variable in size (fertile fronds usually 30–75 cm. long, but sometimes much larger); stipes straw-colored to pale brown, grooved, naked, about as long as the blades. Blades broadly deltate-ovate, mostly 20–60 cm. wide; basal pinnae opposite, stalked, pinnate-pinnatifid and strongly inequilateral, the basiscopic pinnules 2- to 3-times as long as the acroscopic ones, altogether nearly as large as the terminal (central) division of the frond; terminal division pinnate-pinnatifid, the pinnae subopposite, linear to lance-linear, 5–15 cm. long, nearly sessile, acuminate-subcaudate at the apex; segments oblong, mostly 5–12 mm. long and up to 4 mm. wide, rounded at the minutely crenulate tips, separated by rounded sinuses; tissue thin-herbaceous, the costae sometimes minutely puberulous toward their bases beneath, the free veins 1- to 2-forked. Indusium greenish, opaque, entire.

GENERAL DISTRIBUTION: Old World tropics, Polynesia; naturalized at scattered localities in the American tropics.

DISTRIBUTION IN LESSER ANTILLES: St. Lucia, *Proctor 17612*, *18702*, *21587* (IJ).

HABITAT: Wooded hillsides and shaded banks at middle elevations.

9. **Pteris arborea** L., Sp. Pl. 2: 1073. 1753.

Lectotype: Plumier, Tr. Foug. *t. 5*, based on a plant from Morne de la Calebasse, Martinique.
Syn.: *Pteris aculeata* Sw., Prodr. 129. 1788, in part.
Pteris lactuca Poiret in Lam., Encycl. Méth. Bot. 5: 717. 1804. (Type: *Badir*, from Guadeloupe.)
Pteris spinosa Desvaux in Mém. Soc. Linn. Paris 6: 301. 1827, not *Polypodium spinosum* L., 1753. (Type from Martinique.)
Litobrochia aculeata (Sw.) C. Presl, Tent. Pter. 149. 1836.
Litobrochia lactuca (Poiret) C. Presl, Tent. Pter. 149. 1836.
Pteris crassipes J. G. Agardh, Rec. Spec. Gen. Pter. 59. 1839. (Syntypes from Martinique and St. Vincent.)
Pteris longibrachiata J. G. Agardh, Rec. Spec. Gen. Pter. 75. 1839. (Syntypes from Martinique and St. Vincent.)
Litobrochia crassipes (J. G. Agardh) Fée, Mém. Fam. Foug. 5: 135. 1852.
? *Litobrochia agardhii* Fée, Mém. Fam. Foug. 11: 25. 1866, nomen nudum. (Type from Martinique.)

Litobrochia brevinervis Fée, Mém. Fam. Foug. **11**: 27, *t. 8, fig. 2.* 1866. (Type from Guadeloupe.)
Pteris regia Jenman in Gard. Chron. III, **17**: 39. 1895. (Type from Jamaica.)
Pteris brevinervis (Fée) Jenman, Ferns Br. W. Ind. & Guiana 125. 1900.
Pteris multiserialis Jenman, Ferns Br. W. Ind. & Guiana 129. 1900. (Type from Trinidad.)

Rhizome massive, fleshy to subwoody, erect, 8–15 cm. thick, covered with a mass of fibrous roots except at the nearly naked apex, here bearing a few scattered, minute, appressed, translucent-brownish scales. Fronds to 5 m. long or more, glabrous; stipes stout, nearly as long as the blades, grooved on upper (adaxial) side, smooth or bearing scattered short (1–2.5 mm. long), sharp, blackish spines. Blades ternate-pentagonal, to 2.5 m. broad, with very large, long-stalked basal pinnae, these 2-partite near base, the lower (basiscopic) division shorter than the upper, both evenly pinnate-pinnatifid; central division of blade pinnate-pinnatifid, abruptly acuminate at apex with a separate terminal pinna, the lateral pinnae sessile, oblong-linear, to 55 cm. long and 14 cm. broad; segments linear-deltate, to 1.5 cm. broad at base, more or less falcate-acuminate or -attenuate at apex (the sterile tips serrulate), separated by sinuses varying from narrowly acute to broadly rounded; tissue thin-herbaceous, the veins all areolate (except for a few free tips near the margins). Indusium translucent, entire.

General Distribution: Jamaica, Puerto Rico, Trinidad.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

Habitat: Moist rain forest glades and ravines at medium elevations.

This giant species has been repeatedly misinterpreted by various authors, not only because of the large size (most of the herbarium specimens are mere fragments), but also because the fronds vary in texture and dissection according to the stage of the plant's development. For example, both *Pteris lactuca* and *Litobrochia brevinervis* apparently represent juvenile forms. The ultimate mature development, seen by the author in moist sheltered ravines on several islands, is best characterized in the literature by *Pteris longibrachiata.* The plant described by Jenman as *Pteris regia* seems to be merely a form with lobed segments. The prickly nature of the stipes, greatly exaggerated in Plumier's drawing, is a variable character; in some plants the stipes are, in fact, nearly smooth.

10. **Pteris altissima** Poiret in Lam., Encycl. Méth. Bot. 5: 722. 1804.

Type: *Ledru, Herb. Lamarck*, from Puerto Rico (P).
Syn.: *Pteris elata* J. G. Agardh, Rec. Spec. Gen. Pter. 63. 1839. (Type from Panama.)

Litobrochia altissima (Poiret) Fée, Mém. Fam. Foug. 5: 135. 1852.
Litobrochia elata (J. G. Agardh) Fée, Mém. Fam. Foug. 5: 135. 1852.

Rhizome stout, ascending, woody, densely clothed at apex with small linear-oblong scales up to 5 mm. long, each with a glossy black or purple-black narrowly deltate midrib, and broad, thin, light brown, lacerate-ciliate margins. Fronds 1.5–3 m. long; stipes stout, straw-colored, grooved, often as long as the blades. Blades deltate-ovate, pentagonal, up to 1.5 m. long and 1.2 m. broad; basal pinnae much larger, long-stalked, unequally deltate, with an enlarged basal basiscopic pinnule (this and several other divisions deeply pinnatifid, or rarely pinnate at base); other pinnae mostly pinnatifid, broadly cuneate at base, up to 15 cm. broad; segments lance-linear or oblong-linear, the fertile ones up to 1 cm. broad at the middle, attenuate and serrate at the apex, and with broadly rounded sinuses, the sterile ones broader, closer, and with acute sinuses; tissue usually firm-herbaceous, dark green, slightly paler beneath. Indusium brown, opaque, entire.

General Distribution: Greater Antilles, continental tropical America from Mexico to Brazil and Bolivia.

Distribution in Lesser Antilles: Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: Moist wooded hillsides and rocky ravines, chiefly at middle elevations.

Doubtful Record

Pteris podophylla Sw. was attributed to Guadeloupe and Martinique by Duss, Foug. & Lyc. Antill. Franc. 69. 1903. No specimen of this species from the Lesser Antilles has been seen during the preparation of this book.

NEUROCALLIS Fée

Neurocallis Fée, Mém. Fam. Foug. 2: 89. 1845. Figure 27.

A rather large terrestrial fern of moist rain forests. Rhizome short, subwoody, ascending or erect, scaly at the apex. Fronds large, 1-pinnate, glabrous, dimorphic. Sterile fronds with broad green pinnae and coarsely reticulate venation. Fertile fronds much taller than the sterile, with narrow, contracted pinnae, the sporangia forming a broad strip on either side of the costa beneath, extending from the margins nearly to the midrib, slightly protected along the margins by a scarious, reflexed indusium. Sporangia numerous, glabrous; annulus of 20–22 cells; spores tetrahedral, smooth.

Type species: *Neurocallis praestantissima* Bory ex Fée. In several features this genus is intermediate between *Pteris* and *Acrostichum.*

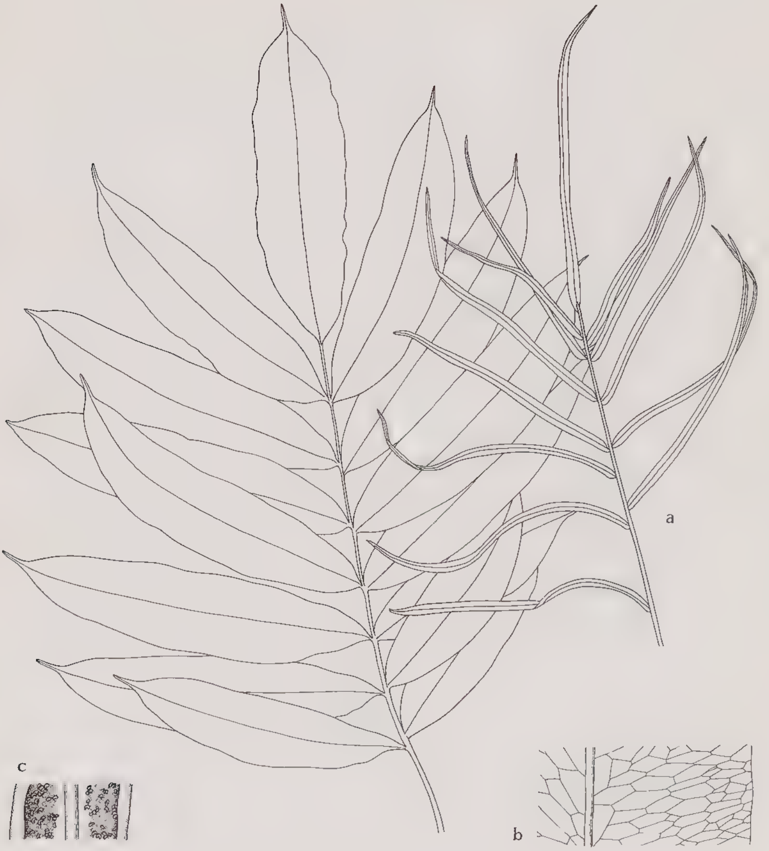

FIGURE 27. **Neurocallis.** a–c, *N. praestantissima*: a, sections of sterile and fertile blades, × 0.3; b, section of sterile pinna with coarsely reticulate venation, × 2.0; c, section of contracted fertile pinna, showing sporangia on either side of the costa beneath, × 1.8.

1. **Neurocallis praestantissima** Bory ex Fée, Mém. Fam. Foug. 2: 89. 1845.

Type: Stated to be "in *Herb. Mougeot et Bory*," collected in Guadeloupe.
Syn.: *Acrostichum praestantissimum* Bory ex Fée, Mém. Fam. Foug. 2: 89. 1845, in syn.; Hook., Gard. Ferns *t. 28.* 1862; Sp. Fil. **5**: 269. 1864.
Chrysodium praestantissimum (Bory ex Fée) Mettenius, Fil. Hort. Lips. 21. 1856.
Lomagramme praestantissima (Bory ex Fée) Griseb., Fl. Br. W. Ind. 678. 1864.
Pteris dominicensis Baker in Hook., Ic. Pl. **17**: *t. 1642*. 1886. (Type from Dominica.)

Rhizome as described above. Fronds clustered; stipes 60–125 cm. long, deep purple below, clothed toward the base with small deciduous scales, these deltate-lanceolate, 1–2 mm. long, blackish-purple, not clathrate, glabrous. Sterile blades 70–100 cm. long, 40–60 cm. broad, pinnate with a separate terminal pinna like the lateral ones; pinnae linear-oblong, 3.5–5.5 cm. broad, acuminate-attenuate at the apex, sessile at the broadly rounded base, the midrib impressed above and prominent beneath, the veins hexagonal-areolate, all joined. Fertile fronds with pinnae ca. 1 cm. broad.

General Distribution: Costa Rica, Colombia.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: Moist, sheltered rain forest glades at chiefly middle elevations.

ACROSTICHUM Linnaeus

Acrostichum L., Sp. Pl. 2: 1076. 1753. Figure 28.

Large, coarse ferns of brackish or saline swamps. Rhizomes woody, erect, bearing scales at the apex. Fronds clustered, erect, 1-pinnate with large, simple pinnae, the venation closely areolate without included veinlets. Sporangia and paraphyses densely covering the under surface of fertile pinnae. Sporangia nonindusiate; annulus of 20–22 cells; spores tetrahedral, minutely tuberculate.

Type species: *Acrostichum aureum* L., pantropical.

Several species (mostly of wide distribution) are known; two occur in the Lesser Antilles.

Key to the Species

a. Fertile blades with only the upper pinnae bearing sporangia; pinnae usually separate; paraphyses minute, dark glistening brown, capitate-stellate .... 1. *A. aureum*
a. Fertile blades usually with all pinnae bearing sporangia; pinnae imbricate; paraphyses large, pale, sausage-shaped .... 2. *A. daneaefolium*

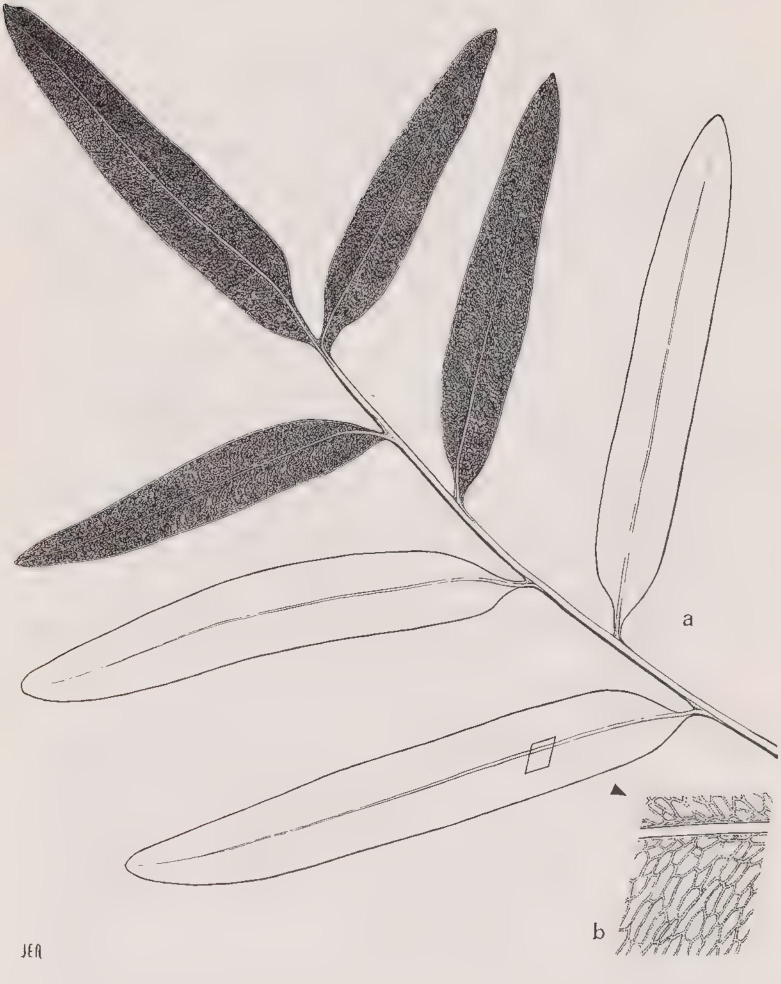

FIGURE 28. **Acrostichum.** a, b, *A. aureum*: a, section of blade with four terminal pinna showing dense cover of sporangia and paraphyses, × 0.4; b, enlarged section (inside box) of pinna showing venation, × 2.0.

1. **Acrostichum aureum** L., Sp. Pl. 2: 1069. 1753.

Type: LINN *1245.5*, of unknown origin.
Syn.: *Chrysodium vulgare* Fée, Mém. Fam. Foug. 2: 97. 1845; Griseb., Fl. Br. W. Ind. 675. 1864. (Based on *Acrostichum aureum* L.)
Chrysodium aureum (L.) Mettenius, Fil. Hort. Lips. 21. 1856.

Rhizomes forming tussocks in swamps, clothed at apex with linear to ovate, rigid, dark brown scales to 1.5 cm. long. Fronds 1.5–3 m. long, not dimorphic; stipes much shorter than the blades, subterete, bearing several alternate indurated spurs. Blades 20–40 cm. broad, obtuse or somewhat acute in outline at the apex; pinnae 10–14 on each side, and a similar terminal one; tissue light green, coriaceous, the margins cartilaginous, revolute. Fertile pinnae 1–4 pairs at the apex of otherwise sterile fronds, similar in size and shape to the sterile pinnae or slightly smaller.

GENERAL DISTRIBUTION: Pantropical.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Lucia, Grenada, Barbados.

HABITAT: Margins of mangrove swamps and in open brackish or salt marshes.

In the Lesser Antilles this is the less common of the two species.

2. **Acrostichum danaeifolium** Langsd. & Fischer, Ic. Fil. 1: 5, *t. 1.* 1810.

Type: *Krusenstern*, from Santa Catarina Island, Brazil.
Syn.: *Chrysodium lomarioides* Jenman in Timehri 4: 314. 1885. (Type from Guyana.)
Acrostichum lomarioides (Jenman) Jenman in Bull. Bot. Dept. Jamaica II, 5: 154. 1898, not Bory, 1833.
Acrostichum excelsum Maxon in Proc. Biol. Soc. Washington 18: 224. 1905.

Rhizomes massive, clothed at apex with rigid, spreading, linear, dark brown scales up to 2 cm. long; stipes very stout, grooved, dark brown (at least on fertile fronds), clothed at base with broadly linear scales to 2.5 cm. long and 3 mm. wide, these with a dark brown longitudinal band in the middle and paler, retrorsely fibrillose margins. Fronds dimorphic, the sterile ones 1.5–3.5 m. long, the fertile ones taller and more rigidly erect; pinnae very numerous, usually 20–40 or more on a side, and a similar terminal one, both sterile and fertile ones often crowded and subimbricate; tissue chartaceous, often finely pubescent beneath, the margins lightly repand-cartilaginous. Fertile pinnae rather fleshy.

GENERAL DISTRIBUTION: Western hemisphere tropics in suitable localities.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Nevis, Montserrat, Guadeloupe, La Desirade, Marie Galante, Dominica, Martinique, St. Lucia, Grenada.

Habitat: Saline or brackish swamps, often associated with *Acrostichum aureum*; occasionally found beside fresh water streams not near the sea.

Subfamily BLECHNOIDEAE

Key to the Genera

a. Veins of sterile pinnae all free; fronds never scandent or climbing . . . . 14. *Blechnum*
a. Veins connected by a marginal strand; fronds vinelike, climbing high on forest trees . . . . 15. *Salpichloena*

BLECHNUM Linnaeus

Blechnum L., Sp. Pl. 2: 1077. 1753. Figure 29.

Syn.: *Struthiopteris* Scop., Fl. Carn. 168. 1760.
Lomaria Willd. in Ges. Naturf. Freunde Berlin Mag. 3: 160. 1809.

Terrestrial or occasionally epiphytic ferns. Rhizomes ascending or erect and often stout, or else more or less elongate and scandent, usually densely clothed with scales, sometimes stoloniferous. Fronds mostly 1-pinnate (rarely simple), usually glabrous, dimorphic or with fronds all similar. Sori elongate-linear, usually continuous, borne near or against the costa on an elongate transverse veinlet parallel to the costa; indusium narrowly linear, continuous or nearly so, firm, opening toward the costa. Sporangia with annulus of 14–28 cells; spores bilateral, usually smooth.

Type species: *Blechnum occidentale* L. of the American tropics.

A large, worldwide genus of at least 180 species, the majority in the southern parts of both hemispheres. In the Lesser Antilles there are 11 species, of which five are endemic.

Special literature: Broadhurst, The genus *Struthiopteris* and its representatives in North America, in Bull. Torrey Bot. Club 39: 257–278; 357–385. 1912.

Key to the Species

a. Fronds all similar, the fertile ones not (or scarcely) contracted.
  b. Blades fully pinnate throughout, the pinnae numerous (20–35 pinnae or more to a side); margins spinulose-serrulate . . . . 1. *B. serrulatum*
  b. Blades pinnate below, but the upper divisions becoming adnate at base and more or less confluent with the attenuate apex; margins entire (but minutely cartilaginous-scabrous).
    c. Pinnae mostly rounded or cordate at base, the lower ones free, scarcely reduced.
      d. Pinnae of fertile fronds 12–30 on a side, the blade gradually reduced at the apex to a narrow terminal segment . . 2. *B. occidentale*

d. Pinnae of fertile fronds 3–8 on a side, the blade abruptly reduced at the apex to a large, entire terminal pinna .... 3. *B. antillanum*

c. Pinnae mostly dilatate-adnate at base, the lower ones gradually reduced (the blade tapering at both ends) .... 4. *B. confluens*

a. Fronds dimorphic, the fertile ones greatly contracted.

e. Sterile pinnae never stalked, always more or less adnate at base; pinnae or segments without scales.

f. Plants scandent-epiphytic, the rhizomes greatly elongate; mature tissue not punctate by transmitted light .... 5. *B. binervatum*

f. Plants usually terrestrial, the rhizome short and more or less erect; mature tissue always punctate by transmitted light.

g. Mature blades ovate-deltate, 12–25 cm. broad; stipes with vestigial scarlike pinnae .... 6. *B. divergens*

g. Mature blades lanceolate, 5–11 cm. broad; stipes of sterile fronds without vestigial scarlike pinnae .... 7. *B. l'herminieri*

e. Sterile pinnae (at least the lower ones) stalked; pinnae bearing at least a few scales beneath.

h. Rhizome scales slender, rigidly erect, with dark centers and pale margins; stipes with wartlike vestigial pinnae; margins of pinnae entire.

i. Tissue papery, essentially glabrous beneath (a few minute fibrillae sometimes on veins beneath); margins flat; sterile pinnae usually 15–20 cm. long .... 8. *B. insularum*

i. Tissue leathery, stiff, densely reddish-fibrillose beneath; margins strongly reflexed; sterile pinnae 6–10 cm. long ..... 9. *B. rufum*

h. Rhizome scales relatively broad, flaccid, without contrasting dark centers; stipes without vestigial pinnae; margins serrulate.

j. Stipes red-purple to blackish; lower fertile pinnae bearing retrorse spurs in the axils .... 10. *B. violaceum*

j. Stipes straw-colored; fertile pinnae lacking spurs in the axils .... 11. *B. ryanii*

1. **Blechnum serrulatum** L. C. Rich. in Act. Soc. Hist. Nat. Paris **1**: 114. 1792.

Type: *LeBlond*, from French Guiana.
Syn.: *Blechnum indicum* of many authors, not Burm., 1768.

Rhizome subterranean, wide-creeping, 7–10 mm. thick, with erect branches bearing the fronds, and clothed with small, rigid, dark brown scales. Fronds rigidly erect, 0.5–1.2 m. long; stipes shorter than the blades. Blades linear to broadly oblong, abruptly acuminate or somewhat acute at the apex, mostly 35–70 cm. long, 10–30 cm. broad, pinnate throughout, the apical pinna similar to the lateral ones; pinnae narrowly oblong to ligulate, 5–15 mm. broad, sessile, inequilateral at the base, articulate and eventually deciduous; tissue coriaceous, the costae bearing a few small yellowish-brown scales beneath, the veins close, 1- to 3-forked. Sori usually occurring only on upper pinnae; indusium narrow, becoming minutely and irregularly lacerate.

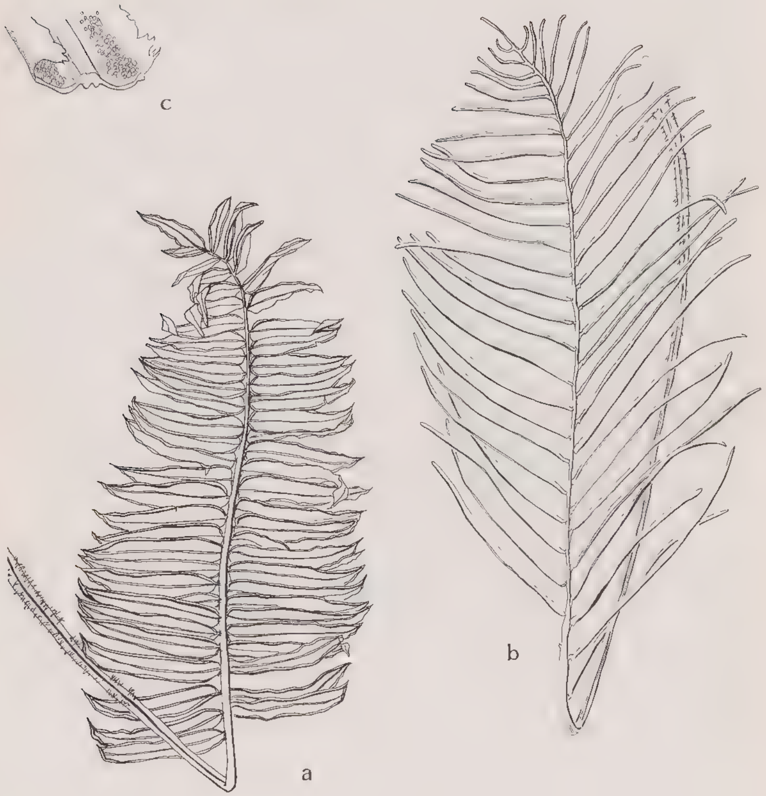

FIGURE 29. **Blechnum.** a–c, *B. violaceum*: a, sterile frond, × 0.3; b, fertile frond, × 0.3; c, section of fertile pinna, × 8.0.

General Distribution: Florida, Bahamas, Greater Antilles, Trinidad, continental tropical America from Mexico to southern Brazil; also in the Old World tropics.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Savannas, moist thickets, and edges of swamps, from sea level to at least 2,500 feet.

2. **Blechnum occidentale** L., Sp. Pl. 2: 1077. 1753, as *B. orientale.*

Type: LINN *1247.1*, from "America meridionale."

Rhizome more or less erect, up to 2 cm. thick, densely scaly at the apex, stoloniferous. Fronds ascending, mostly 30–75 cm. long; stipes of fertile fronds usually as long as the blades, grooved. Blades ovate to oblong-lanceolate, mostly 20–50 cm. long, 6–25 cm. broad, pinnate at base, pinnatisect above, the apex acuminate or attenuate-subcaudate; pinnae lance-linear, falcate, 5–15 mm. broad (widest at base), the lowest ones usually short-stalked and deflexed, the veins several times forked. Sori continuous, equal costal; indusium minutely denticulate-glandular.

General Distribution: Widespread in tropical and subtropical areas from Florida to Argentina.

Distribution in Lesser Antilles: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Banks and wooded slopes at lower to middle elevations; plants common.

3. **Blechnum antillanum** Proctor in Brit. Fern Gaz. 9(6): 214. 1965.

Type: *J. P. 282*, from Jamaica (IJ).
Syn.: *Blechnum longifolium* sensu Duss, Foug. & Lyc. Antill. Franc. 88. 1903, not Humb. & Bonpl. ex Willd. in L., 1810.

Murillo (Nova Hedwigia **16**: 358–361. 1968) has included the Antillean plants here called *Blechnum antillanum* within *B. fraxineum* Willd.

Rhizome short-creeping to ascending, scaly at apex, weakly stoloniferous. Fronds ascending, mostly 15–30 cm. long; stipes of fertile fronds as long as or exceeding the blades. Blades oblong-ovate to broadly ovate, 8–15 cm. broad, fully pinnate at base, pinnatisect above; pinnae lance-linear or lance-oblong, falcate, 10–18 mm. broad (widest near the middle), the basal ones slightly deflexed, the veins simple to 1- or 2-forked. Sori continuous or often interrupted, those of upper divisions often decurved at base along the rhachis; indusium minutely ciliolate.

General Distribution: Greater Antilles, Central and South America.

DISTRIBUTION IN LESSER ANTILLES: Martinique, St. Vincent.

HABITAT: Shaded banks, especially along streams, at lower to middle elevations.

Although the Antillean plants here called *Blechnum antillanum* fall within the broad circumscription given to *B. fraxineum* Willd. by Murillo, the present writer feels that the "highly variable" character of *B. fraxineum* is taxonomically an unacceptable way of disposing of such diverse populations whose differences surely have a genetic basis susceptible to analysis.

Recent cytological study of the plants growing at the type locality in Jamaica shows them to represent a triploid hybrid, propagating at that place by vegetative means (stolons) only. The parentage of these plants is not yet known. Also unknown is the cytological nature of the other West Indian and continental populations which are grouped here on a purely morphological basis with the Jamaican triploid. It seems highly undesirable at this stage to lump these plants under a name (*B. fraxineum*) whose type is a specimen of very different morphology.

4. **Blechnum confluens** Schlecht. & Cham. in Linnaea **5**: 613. 1830; Murillo in Nova Hedwigia **16**: 347. 1968.

Type: *Schiede 779*, from Hacienda Laguna, Mexico.
Syn.: *Blechnum unilaterale* sensu Duss, Foug. & Lyc. Antill. Franc. 88. 1903, not Sw., 1810.

Rhizome erect or decumbent, 0.5–1.5 cm. thick, scaly at the apex, stoloniferous. Fronds laxly ascending, 20–70 cm. long; stipes much shorter than the blades. Blades lance-linear, tapering at both ends from the middle, 3–9 cm. broad, the lower divisions separate, much shorter than the middle ones and broader than long; middle pinnae narrowly oblong to linear, 4–7 mm. broad at the middle, the bases adnate and dilate, the veins mostly 1-forked. Sori subcostal, usually continuous, the upper (acroscopic) line often shorter than the lower; indusium narrow, with minutely erose margins.

GENERAL DISTRIBUTION: Greater Antilles, continental tropical America from Mexico to southern Brazil.

DISTRIBUTION IN LESSER ANTILLES: Martinique (very rare).

HABITAT: Moist, open or partly shaded banks at chiefly middle elevations. In the Greater Antilles, presence of this species indicates a noncalcareous substratum.

5. **Blechnum binervatum** (Poiret) Morton & Lellinger in Amer. Fern J. **57**: 67. 1967.

Basionym: *Polypodium binervatum* Poiret in Lam., Encycl. Méth. Bot. 5: 521. 1804.
Type: *Herb. Jussieu, Cat. 1365*, from an unknown locality (P).

Syn.: *Lomaria plumieri* Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 325. 1811.
Lomaria martinicensis Sprengel, Neue Entd. **3**: 5. 1822. (Type from Martinique.)
Lomaridium plumieri (Desvaux) C. Presl, Epim. Bot. 155. 1851.
Spicanta plumieri (Desvaux) Kuntze, Rev. Gen. Pl. **2**: 820. 1891.
Blechnum plumieri (Desvaux) Diels in Engler & Prantl, Nat. Pflanzenfam. 1(4): 248. 1899.
Struthiopteris plumieri (Desvaux) Broadh. in Bull. Torrey Bot. Club **39**: 269. 1912.

Rhizome subwoody, elongate and scandent, 1–3 cm. thick, clothed with numerous concolorous brown or reddish-brown linear or lance-linear scales, these 1–1.8 cm. long. Fronds mostly near the apex of rhizome, the older ones deciduous. Sterile fronds arching or pendent, up to 115 cm. long; stipes much shorter than the blades, often with a few minute vestigial pinnae. Blades mostly lanceolate to broadly lanceolate, 4–15(–20) cm. broad, deeply pinnatisect; divisions (pinnae and segments) numerous, 25–60 (–75) to a side, the lowermost ones often separate, narrowly deltate-oblong to linear, often falcate, 8–12 mm. broad, with entire or subentire margins; tissue membranous to rigidly herbaceous or subcoriaceous, without scales, nearly opaque, the veins mostly 1-forked near the base, with tips not reaching the margins. Fertile fronds rigidly erect, shorter than the sterile, with linear pinnae 2–4 mm. broad. Indusium entire.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Climbing especially on tree-fern trunks in moist montane forests.

This species is morphologically very similar to *Blechnum fragile* (Liebm.) Morton & Lellinger of the Greater Antilles and other areas, and *Blechnum kunthianum* C. Chr. of northern South America. The existence of apparent intermediates in the Lesser Antilles and elsewhere suggests that all these populations might better be considered geographic races of a single species. A careful study of the group using modern techniques is needed.

6. **Blechnum divergens** (Kunze) Mettenius in Ann. Sci. Nat. Bot. V, **2**: 255. 1864.

Basionym: *Lomaria divergens* Kunze in Linnaea **9**: 57. 1834.
Type: *Poeppig, Diar. 1141*, from Pampayaco, Peru.
Syn.: *Lomaria exaltata* Fée, Mém. Fam. Foug. **11**: 10, *t. 3*. 1866. (Type from Guadeloupe.)
Struthiopteris exaltata (Fée) Broadh. in Bull. Torrey Bot. Club **39**: 264. 1912.

Rhizome erect, 4–15(–40) cm. long, usually standing above the ground, clothed at apex with pale brown, lanceolate to lance-ovate scales ca. 10

mm. long and 2–2.5 mm. wide. Sterile fronds 30–90 cm. long; stipes shorter than the blades and marked with several pairs of obscure, scar-like, vestigial pinnae. Blades pinnatisect, abruptly reduced at base (with or without 1–3 pairs of semicircular lobes), gradually reduced above to the 5–9 cm. long terminal lobe; segments 9–18 to a side, deltate to oblong, mostly straight, acute at apex, and 1.5–3 cm. broad, the margins entire, sometimes slightly revolute; tissue rigid-herbaceous, closely punctate throughout, the veins distant (6–7 per cm.), mostly 1-forked near the base, with tips not reaching the margins. Fertile fronds taller than the sterile, 10–22 cm. broad, with 12–22 pinnae to a side, these 3–4 mm. broad, linear with dilated bases. Indusium entire, not becoming lacerate.

General Distribution: Greater Antilles except Jamaica; continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: Terrestrial in moist rain forest glades at middle to higher elevations.

7. Blechnum l'herminieri (Bory) C. Chr., Ind. Fil. 156. 1905.

Basionym: *Lomaria l'herminieri* Bory in Kunze, Farrnkr. 173, *t. 73.* 1845.
Type: *Bory 201*, from Guadeloupe.
Syn.: *Lomaridium l'herminieri* (Bory) C. Presl, Epim. Bot. 263. 1851.
Spicanta l'herminieri (Bory) Kuntze, Rev. Gen. Pl. 2: 820. 1891.
Struthiopteris l'herminieri (Bory) Broadh. in Bull. Torrey Bot. Club 39: 267. 1912.

Rhizome erect, slender, mostly to 6 cm. (rarely to 15) long, usually standing above the ground, at apex bearing glossy, dark brown, lance- to ovate-attenuate scales, these up to 5 mm. long and 1 mm. broad. Sterile fronds 20–40 cm. long; stipes much shorter than the blades (mostly 3–6 cm., rarely more), without vestigial pinnae. Blades pinnatisect, abruptly reduced at base to usually 2 pairs of semicircular lobes, gradually reduced above to the acute or shortly acuminate apex; segments mostly 9–15 to a side, oblong to oblong-falcate, broadly acute at the apex, 1–1.5 cm. broad, the margins entire, flat or minutely revolute; tissue dark green, rigid-herbaceous, without scales, the veins widely spaced (3–6 per cm.), mostly 1-forked above the base, with tips enlarged and not reaching the margins. Fertile fronds scarcely longer than the sterile but with longer stipes, these sometimes with faint vestigial pinnae; pinnae 10–17 to a side, 1.5–3 mm. broad. Indusium entire, not becoming lacerate.

General Distribution: Honduras, Costa Rica.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: Wet sheltered glades of montane forests at middle to higher elevations. *B. l'herminieri* and *B. divergens* often grow together in places where their ranges coincide. No instance of intermediate forms has been noted.

8. **Blechnum insularum** Morton & Lellinger in Amer. Fern J. **57**: 70. 1967.

Type: *Morton 5822*, from Cumberland Mountain, St. Vincent (US).
Syn.: *Lomaria boryana* sensu Jenman, Ferns Br. W. Ind. & Guiana 139. 1909, in part, not Willd. in L., 1810.

Rhizome large, erect, usually epiphytic, up to 50 cm. tall, clothed at apex with numerous rigid, shining, lance-linear scales ca. 10–15 mm. long and up to 2.5 mm. broad at base, dark brown with pale margins. Mature sterile fronds up to 1 m. long; stipes much shorter than the blades and beset with several pairs of wartlike vestigial pinnae. Sterile blades elliptic-oblong, reaching 70 cm. in length, 17–40 cm. broad, abruptly reduced at base, and short-acuminate at the apex with an elongate terminal pinna; rhachis clothed with a few reddish-brown fibrillose scales; pinnae up to 20 pairs or more, alternate, more or less lance-linear, 1.5–2.5 cm. broad, with a narrowly acuminate, often falcate apex, the margins entire, not revolute; tissue firmly papery, paler beneath, the veins rather close, mostly 0.6–0.8 mm. apart, usually 1-forked near the base. Fertile fronds longer than the sterile; pinnae narrowly linear, 3–5 mm. broad. Indusium brown, deeply and often finely lacerate with age.

GENERAL DISTRIBUTION: Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat (?), St. Vincent.

HABITAT: Mossy montane forests at higher elevations; plants not common.

Blechnum insularum might better be considered a geographic variety of *B. underwoodianum* (Broadh.) C. Chr. The typical form of *B. underwoodianum* occurs in Jamaica and Hispaniola, and differs chiefly in having much longer rhizome scales and slight differences of proportion and texture. Morton and Lellinger stressed the fact that the Lesser Antillean population is always epiphytic, in contrast with the Jamaican and Hispaniolan plants which they supposed to be invariably terrestrial. However, I have several times seen typical *B. underwoodianum* growing as an epiphyte in Jamaica.

9. **Blechnum rufum** (Sprengel) C. Chr., Ind. Fil. Suppl. 17. 1913.

Basionym: *Lomaria rufa* Sprengel in Nova Acta Acad. Caes. Leop.-Carol. **10**: 230. 1821.
Type: Collector unspecified, from "Islands of the Caribbean," almost certainly Guadeloupe.
Syn.: *Lomaria robusta* Fée, Mém. Fam. Foug. **5**: 69. 1852. (Type from Guadeloupe.)

Struthiopteris rufa (Sprengel) Broadh. in Bull. Torrey Bot. Club 39: 369. 1912.

Rhizome stout, erect, trunklike, to 12 cm. thick, bearing scales to 3.5 cm. long and 1–2 mm. broad, these dark brown with pale margins. Sterile fronds 30–60 cm. long; stipes dull brownish, rufous-scaly, shorter than the blades and marked throughout with wartlike, vestigial pinnae. Blades 13–20 cm. broad, elliptic to oblong, abruptly reduced or subtruncate at base, acuminate at apex with a terminal pinna 4–7 cm. long; rhachis densely fibrillose-scaly; pinnae elliptic to oblong, 12–25 to a side, crowded or overlapping, the lower ones deflexed, 17–27 mm. broad, the margins strongly revolute; tissue very rigid and coriaceous, the under surface (abaxial side) more or less densely yellowish to reddish cobweby-fibrillose, the veins very close, obscure. Fertile fronds longer than the sterile, up to 115 cm. long; pinnae up to 35 to a side, 5–6 mm. broad, of very thick and heavy texture. Indusium lacerate.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Martinique (?).

Habitat: Exposed mossy slopes on summits of volcanic mountains; plants rare.

10. Blechnum violaceum (Fée) C. Chr., Ind. Fil. 161. 1905.

Basionym: *Lomaria violacea* Fée, Mém. Fam. Foug. **11:** 11, *t. 5.* 1866.
Lectotype: Fée, Mém. Fam. Foug. **11:** *t. 5*, based on a specimen from Guadeloupe.
Syn.: *Struthiopteris violacea* (Fée) Broadh. in Bull. Torrey Bot. Club 39: 379. 1912.

Rhizome erect, usually 2–4 cm. thick (or more ?), bearing at apex thin, light- to dark-brown, narrowly lance-deltate scales up to 5 mm. long when dry, these viscid-gelatinous in life. Sterile fronds to 100 cm. long or more; stipes shining violet-brown to blackish-maroon, often longer than the blades, bearing small scales resembling the larger ones of the rhizome, and often with a few blunt spines above. Blades broadly lanceolate to ovate-oblong, 7–25 cm. broad, truncate or abruptly reduced at base, short-acuminate at apex; rhachis naked, shining maroon-brown or blackish-purple; pinnae 12–50 to a side (28 in the type), linear-oblong, 8–16 mm. broad, subcordate to cordate at base, the margins more or less revolute; tissue papery to coriaceous (rarely membranous), opaque, the veins finely grooved above, raised beneath, close (14–16 per cm.), obscure, simple or forked at the base. Fertile fronds taller than the sterile; pinnae contracted, 3–5 mm. broad, the lower ones distinctly stalked. Indusium finely and irregularly lacerate.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

HABITAT: Mossy banks and thickets at high elevations on volcanic mountains.

11. **Blechnum ryanii** (Kaulf.) Hieron. in Hedwigia 47: 245. 1908.

Basionym: *Lomaria ryanii* Kaulf., Enum. Fil. 155. 1824.
Type: *Forsström*, from Montserrat (BM, isotype).
Syn.: *Onoclea striata* Sw., Syn. Fil. 304, 422. 1806. (Type: *Forsström*, from St. Kitts.)
  Lomaria striata (Sw.) Willd. in L., Sp. Pl. 5: 291. 1810.
  Lomaria procera sensu Duss, Foug. & Lyc. Antill. Franc. 71. 1903, not Sprengel, 1827.
  Blechnum striatum (Sw.) C. Chr., Ind. Fil. 160. 1905, not R. Br., 1810.
  Struthiopteris striata (Sw.) Broadh. in Bull. Torrey Bot. Club 39: 375. 1912.
  Blechnum nesioticum Kramer in Acta Bot. Neerl. 9: 299. 1960.

Rhizome decumbent to erect, woody, to 3 cm. thick, densely clothed at apex with light brown, papery, ovate or oblong scales to 20 mm. long and 5 mm. broad. Sterile fronds to 125 cm. long or more; stipes equalling or longer than the blades, usually straw-colored or light brown, bearing numerous deciduous, papery scales which leave minute spinelike points after falling. Blades broadly lanceolate to broadly oblong, 12–35 cm. broad, truncate at base, acute at apex; rhachis usually straw-colored, deciduously scaly; pinnae 7–23 to a side, lance- or linear-oblong, slightly falcate, 1.5–3 cm. broad, cordate at base, the margins revolute; tissue rigid-herbaceous to coriaceous, usually naked, the costae fibrillose-scaly beneath (the scales light brown), the veins finely grooved above, raised beneath, distinct, mostly 1-forked, with enlarged tips not reaching the margins, often bearing on the underside a few minute scattered fibrillae or whitish-translucent deciduous scales. Fertile fronds taller than the sterile, to 175 cm. long; pinnae linear, 3–6 mm. broad. Indusium irregularly and deeply lacerate.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Terrestrial, on moist banks and in thickets and mossy woodlands at higher elevations; plants common.

SALPICHLOENA John Smith

Salpichloena J. Smith in Hook. & Bauer, Gen. Fil. *t. 93.* 1841.
FIGURE 30.

Rhizome subterranean, woody, wide-creeping, to 2 cm. in diameter, clothed with numerous narrow, spreading, dark brown scales. Fronds glabrous; stipe and rhachis very elongate and high-climbing. Blade 2-pinnate; pinnae alternate, broadly ovate in outline, long-stalked; pin-

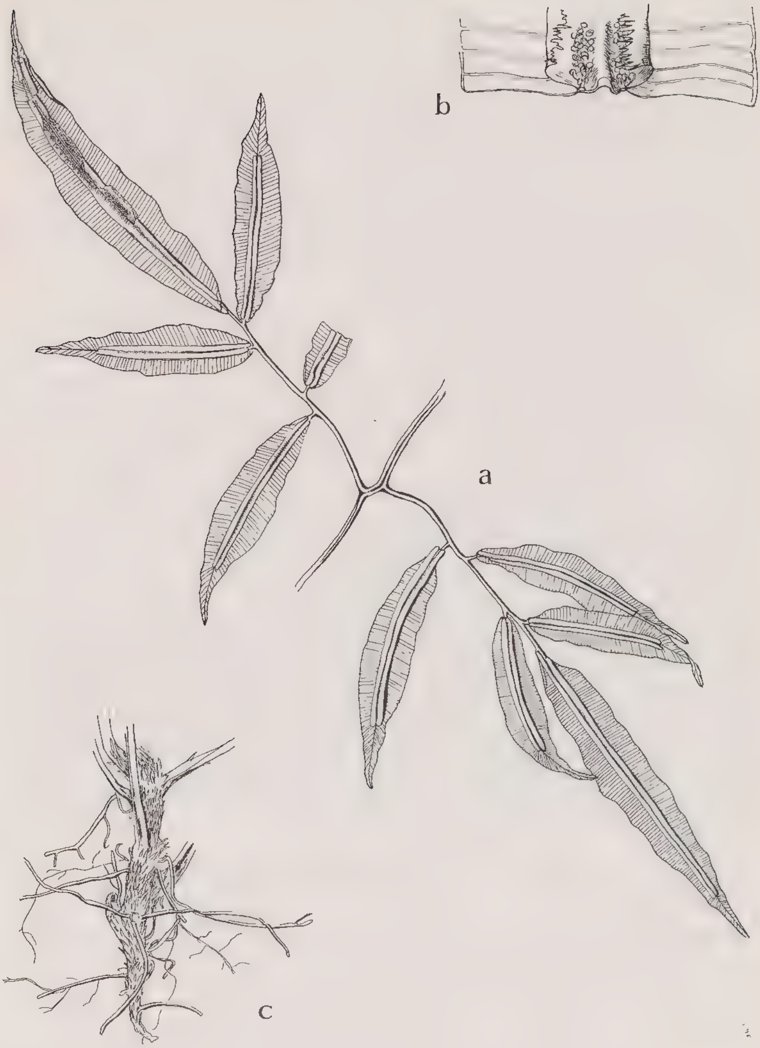

FIGURE 30. **Salpichloena.** a–c, *S. volubilis*: a, section of blade, showing two alternate pinnae, × 0.6; b, section of pinnule, showing venation and sori, × 2.4; c, rhizome, × 0.6.

nules simple and entire, the veins simple or 1-forked near the base, connected by a transverse strand near the margins. Sori elongate on a fertile vein parallel to the costule on either side (these soral veins absent on sterile pinnules); indusium dark brown, attached to the inner side of the fertile vein (next to the costule), at first tubular, eventually opening outwardly to expose the numerous sporangia, at ultimate maturity breaking into sections, which, together with the associated sporangia, fall away completely leaving an apparently sterile pinnule. Sporangia with annulus of ca. 24 cells; spores bilateral, smooth or minutely roughened.

TYPE SPECIES: *Salpichloena volubilis* (Kaulf.) J. Smith of the Lesser Antilles, Central and South America.

1. **Salpichloena volubilis** (Kaulf.) J. Smith in Hook. & Bauer, Gen. Fil. *t. 93.* 1841.

Basionym: *Blechnum volubile* Kaulf., Enum. Fil. 159. 1824.
Type: No collector cited; origin stated to be "India orientale ?", obviously a bad guess. In the absence of a possible type specimen, Hooker & Bauer's *t. 93* can be designated neotype.
Syn.: *Blechnum scandens* Bory, Dup. Voy. Bot. 1: 272, *t. 36.* 1828.
Salpichloena scandens (Bory) C. Presl, Epim. Bot. 122. 1849.
Lomaria volubilis Hook., Sp. Fil. 3: 39, *t. 150.* 1860. (Type: *Spruce 1263*, from Barra do Rio Negro, Brazil.)

Rhizome scales lance-deltate, blackish at base, to 5 mm. long and 0.5–1.5 mm. broad; relative length of stipe not recorded. Pinnae 30–70 cm. long, 25–60 cm. broad; pinnules mostly 5–8 to a side (or rarely less), averaging about 1.5 cm. broad (sterile pinnules up to 6 cm. broad), acuminate at apex, cuneate at base, on stalks up to 2 cm. long; tissue firmly papery; fertile pinnules more or less like the sterile, or sometimes greatly contracted and with very little leafy tissue (such a dimorphic plant was the basis of Hooker's *Lomaria volubilis*). Sori continuous; indusium firm, with finely lacerate free margin.

GENERAL DISTRIBUTION: Central and South America, especially in lowland rain forest areas.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia.

HABITAT: Moist rain forests at lower to middle elevations.

Subfamily ADIANTOIDEAE

KEY TO THE GENERA

a. Sporangia scattered along the veins, not in marginal sori.
  b. Fronds pinnate; veins all free.
    c. Rhizome with hairs only; blades without waxy powder beneath .... 16. *Eriosorus*

        c. Rhizome bearing scales; blades coated with white or yellow waxy powder beneath .... 17. *Pityrogramma*
    b. Fronds palmately lobed; veins all reticulate .... 18. *Hemionitis*
a. Sporangia in marginal sori.
    d. Fronds palmately lobed; veins free or reticulate ...... 19. *Doryopteris*
    d. Fronds pinnately or palmately compound; veins all free.
        e. Sori located on the frond tissue, protected by a reflexed indusium.
            f. Blades pinnately compound; rhachis terete, not winged .... 20. *Cheilanthes*
            f. Blades palmately compound with radiate pinnae; rhachises 2-winged on upper side .... 21. *Adiantopsis*
        e. Sori located on the underside of reflexed indusioid flaps; venation more or less dimidiate or flabellate .... 22. *Adiantum*

ERIOSORUS Fée

Eriosorus Fée, Mém. Fam. Foug. 5: 152, *t. 13-B*, *fig. 1*. 1852.
FIGURE 31.

Syn.: *Gymnogramma* of many authors, not Desvaux, 1811.
Psilogramme Kuhn, Chaetopt. (Fests. 50 Jub. Reals. Berl.) 332. 1882.

Terrestrial ferns of small to medium size, or sometimes with elongate scrambling or scandent fronds. Rhizome creeping or suberect, clothed with stiff, pluricellular, golden- or reddish-brown to black hairs. Fronds various, 1- to 6-pinnate; stipe often purplish-brown, terete or nearly so at least in the lower part, usually pubescent or glandular. Rhachis sometimes flexuous; ultimate divisions usually bifid, sometimes orbicular or ovate; tissue of rather thin texture and often pubescent with septate hairs, the venation free, dichotomous. Sporangia scattered more or less densely along the veins, sometimes restricted to a submarginal zone, developing in acropetal sequence; indusium and paraphyses lacking; annulus of 12–26 cells; spores tetrahedral, often ridged and tuberculate. Gametophyte spathulate, the antheridia and archegonia produced laterally.

TYPE SPECIES: *Eriosorus scandens* Fée, a synonym of *E. aureonitens* (Hook.) Copel., of Peru.

A very coherent genus of 25 species and numerous hybrids, the majority occurring in Brazil, the Andes, and Costa Rica. A single rare species has been found in the Lesser Antilles.

SPECIAL LITERATURE: A. Tryon, A monograph of *Eriosorus*, in Contr. Gray Herb. 200: 54–174, *figs. 1–37*, *maps 1–21*. 1970.

1. **Eriosorus hispidulus** (Kunze) Vareschi in Fl. Venez. 1(2): 640. 1969. var. **dominicensis** A. Tryon in Contr. Gray Herb. 200: 115. *fig. 16-B*. 1970.

Type: *K. L. Chambers 2596*, from the summit of Morne Trois Pitons, Dominica (GH, holotype).

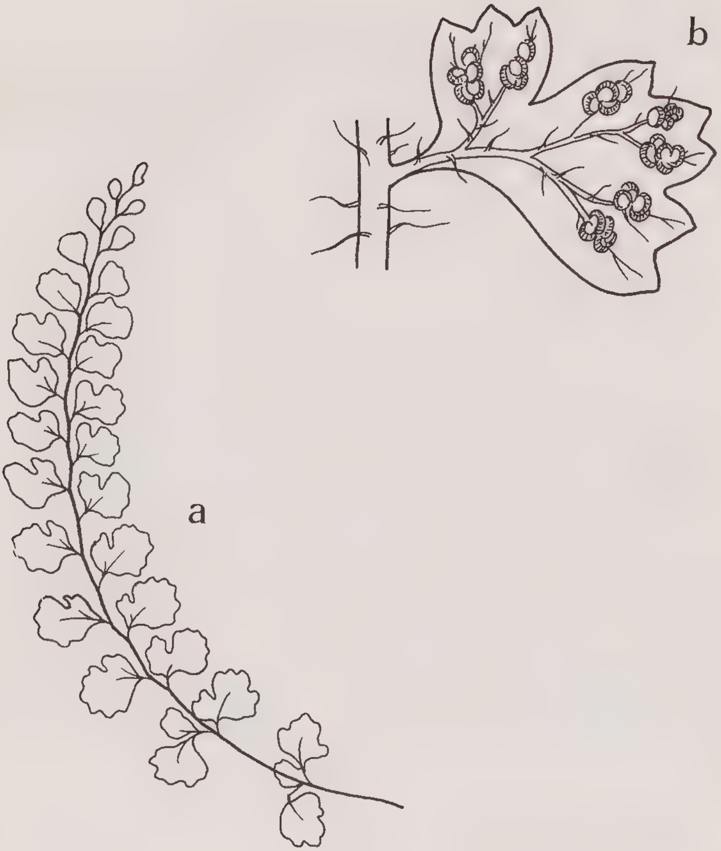

FIGURE 31. **Eriosorus.** a, b, *E. hispidulus* var. *dominicensis*: a, frond, × 1.0; b, pinna with section of rhachis, × 4.0. (Redrawn from A. Tryon, A monograph of the fern genus *Eriosorus*, in Contr. Gray Herb. **200**: 113. 1970.)

Rhizome decumbent, short, 2–8 mm. in diameter, clothed with stiff, bristlelike, dark brown hairs often several cells thick at the base. Fronds probably arching or pendent; stipes slender, purple-brown, nearly equalling the blades. Blades linear-elongate, 1-pinnate or barely 2-pinnate in the lower part, 1.5–2 cm. broad; rhachis somewhat bristly-pubescent with nonglandular hairs; pinnae ovate or suborbicular, dentate-lobed or the lower ones with one free acroscopic pinnule; tissue bearing bristly, erect hairs on both sides (especially beneath), the veins not reaching the margins. Sporangia rather few, along veins; spores dark brown.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Dominica, known only from the type collection.

Habitat: In pendent mosses on exposed rock, among dwarf trees on a wet mountain top.

The typical variety of this species occurs in Puerto Rico (at the summit of Mt. El Yunque), and in northern South America.

PITYROGRAMMA Link

Pityrogramma Link, Handb. Gewächs. 3: 19. 1833. Figure 32.

Small to medium-sized terrestrial or epipetric ferns. Rhizomes short-creeping to erect, clothed with narrow, more or less attenuate, nonclathrate scales. Fronds clustered, not (or only slightly) dimorphic, not articulate to the rhizome; stipes mostly dark, hard, and lustrous. Blades 1- to 3-pinnate, linear to deltate-pentagonal, covered on abaxial side with white or yellow to nearly orange waxy powder, sometimes glandular on adaxial (upper) side, usually lacking scales, the veins free. Sori indefinite; indusium absent. Sporangia produced along the course of the veins and often forming confluent lines or masses; annulus of 20–24 cells; spores globose-tetrahedral, dark, with irregularly reticulate-ribbed perine.

Type species: *Pityrogramma chrysophylla* (Sw.) Link, based on *Acrostichum chrysophyllum* Sw. of the West Indies.

A small genus of probably less than 20 species, the majority in the American tropics. Two species are here attributed to the Lesser Antilles.

The genus *Pityrogramma* contains several species that exhibit extreme variability, the reasons for which are not yet understood. Possible causes include hybridization followed by introgression and recombination of hereditary characters, an unusually high rate of mutation, and a wide spectrum of response to different environmental factors. Since the reasons for the confusing variation are not known, it has been necessary to assign deviant populations almost arbitrarily under particular taxa, because several of the more obvious criteria often used in separating species do not apply in these cases. For example, in Lesser Antillean *Pityrogramma*

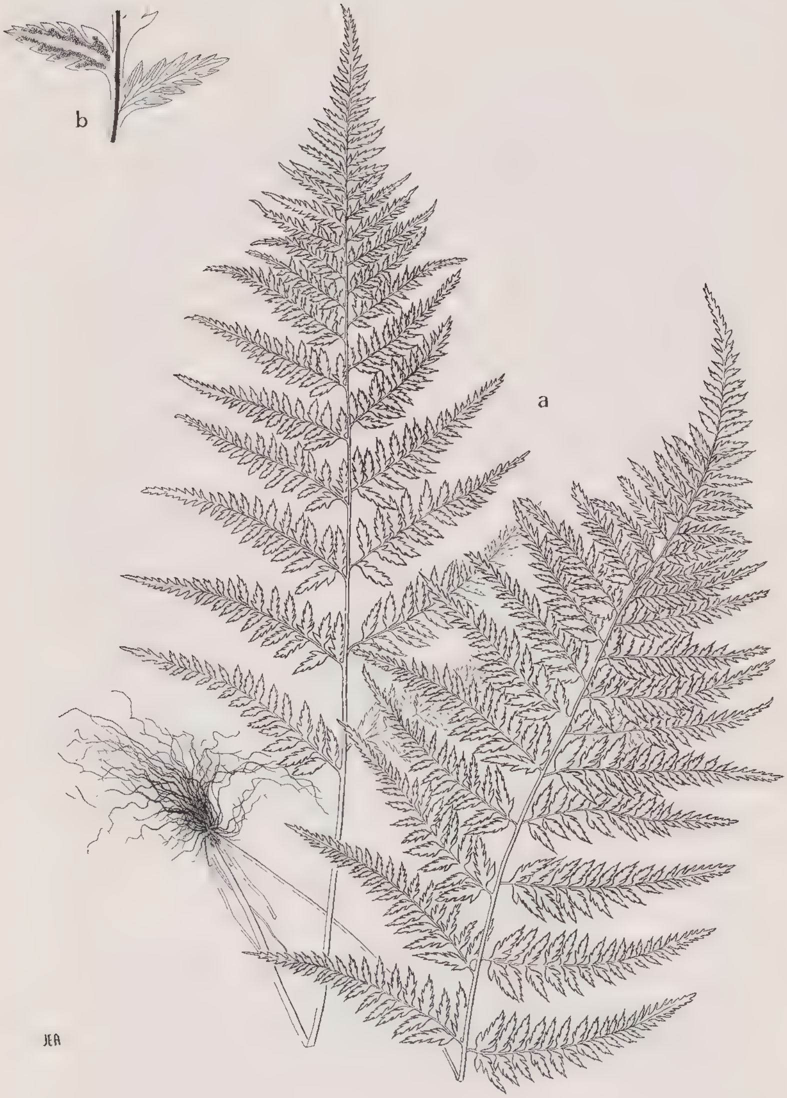

FIGURE 32. **Pityrogramma.** a, b, *P. calomelanos*: a, habit, × 0.4; b, enlarged ultimate divisions, showing venation and sporangia, × 2.4.

such a conspicuous feature as the color of the waxy powder on the underside of the fronds cannot be used as a reliable means of identification. Both species recognized here may have either white or yellow powder; also, several shades of yellow occur.

The identification key which follows is not very satisfactory, because none of the criteria are sufficiently clear-cut (except perhaps the spore characters) to provide unequivocal determinations in most cases.

SPECIAL LITERATURE: R. Tryon, Taxonomic fern notes. II. *Pityrogramma* (including *Trismeria*) and *Anogramma*, in Contr. Gray Herb. **189**: 52–76. 1962. Several papers by K. Domin were consulted in preparing the present treatment, but as they proved all but unusable, they are not specially cited here. References to them will be found in the synonymy of the two accepted species.

KEY TO THE SPECIES

a. Scales at apex of rhizome and base of stipe long-filamentous at apex (a long portion one cell wide below the terminal cell); spores prominently ridged, the ridges with sharply defined margins; small fronds 1-pinnate-pinnatifid, 2-pinnately lobed at base only, and the blade usually of lanceolate or narrowly deltate outline . . . . 1. *P. calomelanos*

a. Scales at apex of rhizome and base of stipe short-acuminate (only a short portion one cell wide below the spherical terminal cell); spores heavily and closely ridged, the ridges with erose margins that give a granular appearance to the spore; all fronds, including the small ones, normally 2-pinnate, the blade usually of more or less deltate outline . . . . 2. *P. chrysophylla*

1. **Pityrogramma calomelanos** (L.) Link, Handb. Gewächs. 3: 20. 1833.

Basionym: *Acrostichum calomelanos* L., Sp., Pl. **2**: 1072. 1753.
Type: LINN *1245.19*, from an unknown locality.
Syn.: *Gymnogramma calomelanos* (L.) Kaulf., Enum. Fil. 76. 1824.
Ceropteris calomelanos (L.) Link, Fil. Hort. Berol. 141. 1841.
Neurogramme calomelanos (L.) Diels in Engler & Prantl, Nat. Pflanzenfam. **1**(4): 264. 1899.
? Pityrogramma tenerrima Domin in Mém. Soc. Sc. Bohême Cl. Sc. **1941**(15): 1. 1942. (Type: *Turner s.n.*, from Montserrat (US).)

Many other synonyms exist, but these were not based on Lesser Antillean types; they have been summarized by Tryon (1962).

Rhizome ascending to erect, clothed at apex with dark golden-brown narrowly lanceolate scales. Fronds tufted, variable, up to 1 m. long; stipes dark glossy reddish-brown, about as long as the blades or shorter. Blades with waxy powder on the underside most often white, but varying to pale or medium yellow (deep yellow variants exist outside our area); pinnae of well developed fronds pinnate-pinnatifid (the whole frond thus 2-pinnate-pinnatifid); ultimate segments lanceolate to elliptic, usually at least sharp-pointed and often more or less sharply serrate or deeply incised. Spores ca. 41–49 μ. in diameter.

GENERAL DISTRIBUTION: Tropical and subtropical America and Africa; naturalized elsewhere in warm regions.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: Open or shaded banks (especially in disturbed soil), in secondary thickets and on open barren slopes at chiefly low to middle elevations.

Occasionally this species grows on sheltered vertical cliffs, and under such conditions the fronds become lax, hang down, and have an uncharacteristic appearance. Such forms have sometimes been called hybrids with *Pityrogramma chrysophylla*, but there is no proof of such an origin. In most ordinary situations *P. calomelanos* has upright fronds.

2. **Pityrogramma chrysophylla** (Sw.)Link, Handb. Gewächs. **3**: 19. 1833.

Basionym: *Acrostichum chrysophyllum* Sw. in J. Bot. Schrader **1800**(2): 14. 1801; Fl. Ind. Occ. **3**: 1598. 1806.

Type: *Swartz*, from "in submontosis Antillarum" (S–PA). Swartz cited Plumier, Tr. Foug. 33, *t. 44* with his original description; this plate was based on a plant presumably from Martinique. However, the authentic but unlocalized specimen in the Swartz herbarium at Stockholm must be considered the holotype.

Syn.: *Acrostichum aculeatum* Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 310. 1811, not L., Syst. Nat. ed. 10. **2**: 1320. 1759.

Gymnogramme chrysophylla (Sw.) Kaulf., Enum. Fil. 74. 1824.

Ceropteris chrysophylla (Sw.) Link, Fil. Hort. Berol. 143. 1841.

? *Ceropteris herminieri* Link, Fil. Hort. Berol. 164. 1841. (Link believed this to be a hybrid between *P. calomelanos* and *P. chrysophylla.*)

? *Gymnogramme l'herminieri* Bory ex Kunze in Linnaea **23**: 255, 310. 1850. (Type from Guadeloupe.)

Ceropteris intermedia Fée, Mém. Fam. Foug. **11**: 30. 1866. (Type from Guadeloupe.)

Gymnogramme calomelanos var. *chrysophylla* (Sw.) Krug ex Urban (incorrectly ascribed to Hook. & Baker) in Engl. Bot. Jahrb. **24**: 134. 1897.

Gymnogramme calomelanos f. *chrysophylla* (Sw.) Duss (incorrectly ascribed to Hook & Baker), Foug. & Lyc. Antill. Franc. 75. 1903.

Gymnogramme calomelanos f. *tartarea* Duss, Foug. & Lyc. Antill. Franc. 75. 1903, not *Acrostichum tartareum* Cav., 1802.

Gymnogramme calomelanos f. *peruviana* Duss, Foug. & Lyc. Antill. Franc. 76. 1903, not *G. peruviana* Desvaux, 1811.

Gymnogramme calomelanos f. *sulphurea* Duss, Foug. & Lyc. Antill. Franc. 76. 1903, not *Acrostichum sulphureum* Sw., 1788.

Pityrogramma caribaea Domin in Publ. Fac. Sci. Univ. Charles **88**: 6. 1928. (Type from Dominica.)

Pityrogramma chrysophylla var. *plumeriana* Domin, Pter. Dominica 151, *t. 24, fig. 1.* 1929.

Pityrogramma chrysophylla var. *divulgata* Domin, Pter. Dominica 151. 1929.

Pityrogramma chrysophylla var. *dominicensis* Domin, Pter. Dominica 151. 1929.

Pityrogramma chrysophylla var. *gabrielae* Domin, Pter. Dominica 151. 1929.

Pityrogramma chrysophylla var. *canoceracea* Domin in Rozpr. České Akad. II., **51**(15): 4. 1941.

Pityrogramma chrysophylla vars. *caribaea* & *imrayana* Domin, in Rozpr. České Akad. II, **51**(15): 5. 1941.

Pityrogramma martinicensis Domin in Mém. Soc. Sc. Bohême Cl. Sc. **1941**(15): 1. 1942. (Type: *Duss 1509*, from Martinique (US).)

Pityrogramma montserratensis Domin, Mém. Soc. Sc. Bohême Cl. Sc. **1941**(15): 2. 1942. (Type: *Shafer 49*, from Montserrat (US).)

Rhizome ascending to erect, clothed at the apex with yellowish-brown lanceolate scales. Fronds loosely tufted, highly variable, mostly 10–60 cm. long; stipes dark brown or purplish, glossy, varying from shorter to much longer than the blades. Blades varying in texture from membranous to coriaceous, and in outline from lance-oblong to deltate, the waxy powder on the underside often pale to deep yellow, but frequently white (especially in specimens from the Leeward Islands); pinnae pinnate to pinnate-pinnatifid; ultimate divisions lance-ovate to broadly elliptic, usually blunt and often entire or but little incised. Spores 42 μ. in diameter.

General Distribution: Puerto Rico; introduced in Samoa, where it has usually been called *Pityrogramma brackenridgei.*

Distribution in Lesser Antilles: St. Barthelemy, Saba, St. Kitts, Nevis, Redonda, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Rocky banks, road cuts, in crevices of cliffs (sometimes of old masonry), or around the bases of exposed boulders at low to high elevations. This species apparently can thrive in more exposed and windswept conditions than the preceding, has a greater altitudinal range, and grows in greatly differing conditions of moisture and exposure.

Doubtful Records

Pityrogramma ebenea (L.) Proctor, widely but incorrectly known as *P. tartarea*, has been attributed to Guadeloupe and Martinique by several writers. Apparently these records were based on stiff montane forms of *P. chrysophylla* with white waxy powder beneath. R. Tryon (Contr. Gray Herb. 189: 58. 1962.) has specifically excluded this species from the Lesser Antilles list.

Pityrogramma dealbata (C. Presl) R. Tryon, long known as *P. schaffneri*, has been recorded from several Lesser Antillean islands, chiefly on the basis of identifications by the late A. H. G. Alston at the British Museum (Natural History). It is now believed that all this material pertains to a white-backed form of *P. chrysophylla* prevalent especially in the drier part of the Leeward Islands and that true *P. dealbata* is confined to Central America.

Pityrogramma subflexuosa Domin in Publ. Fac. Sci. Univ. Charles 88: 7. 1928, was based on a specimen allegedly collected in Montserrat by Holme in 1879, deposited at Kew. The type consists of a single large 3-pinnate frond with cuneate-flabellate ultimate segments. It may represent a form of the African *Pityrogramma argentea* (Willd.) Domin, a species sometimes cultivated in other regions. There is nothing to indicate whether the specimen came from a cultivated plant, or represents a wild population that no one has seen again. In the absence of further information, nothing more can be said about *P. subflexuosa*, except that it cannot be equated with either *P. calomelanos* or *P. chrysophylla*.

Pityrogramma sulphurea (Sw.) Maxon was apparently attributed to Guadeloupe by Duss (1903) as a "form" of *P. chrysophylla*. As this species is otherwise confined to the Greater Antilles, and no authentic Lesser Antillean material has been seen during the preparation of this book, it seems best to exclude *P. sulphurea* from further consideration.

HEMIONITIS Linnaeus

Hemionitis L., Sp. Pl. 2: 1077. 1753. FIGURE 33.

Small, terrestrial, soft-herbaceous ferns. Rhizomes short-creeping to erect, bearing numerous lax, thin scales intermixed with pluricellular hairs. Fronds somewhat dimorphic, the sterile ones short-stalked and spreading, the fertile ones long-stalked and rigidly erect; stipes dark purple-brown to black. Blades palmately or pinnately lobed, or fully pinnate (rarely entire); divisions broad and nearly or quite entire, the venation areolate, without included free veinlets. Sporangia in copious superficial lines, following the course of the veins throughout, lacking indusium or paraphyses; annulus of 14–20 cells; spores globose, reticulate-spiny.

TYPE SPECIES: *Hemionitis palmata* L., of tropical America.

A small genus of about 15 species, the majority in tropical areas of the Western Hemisphere. Only the type species is known to occur in the Lesser Antilles.

1. **Hemionitis palmata** L., Sp. Pl. 2: 1077. 1753.

Type: LINN *1248.3*, from "America meridionali."

Rhizome short, suberect, 5–10 mm. thick, its scales pale brown or tawny. Fertile fronds 15–35 cm. long; stipes several times as long as the blades, deciduously villous. Blades pentagonal, often bearing a viviparous bud at the base of the apical lobe, soft-hairy throughout.

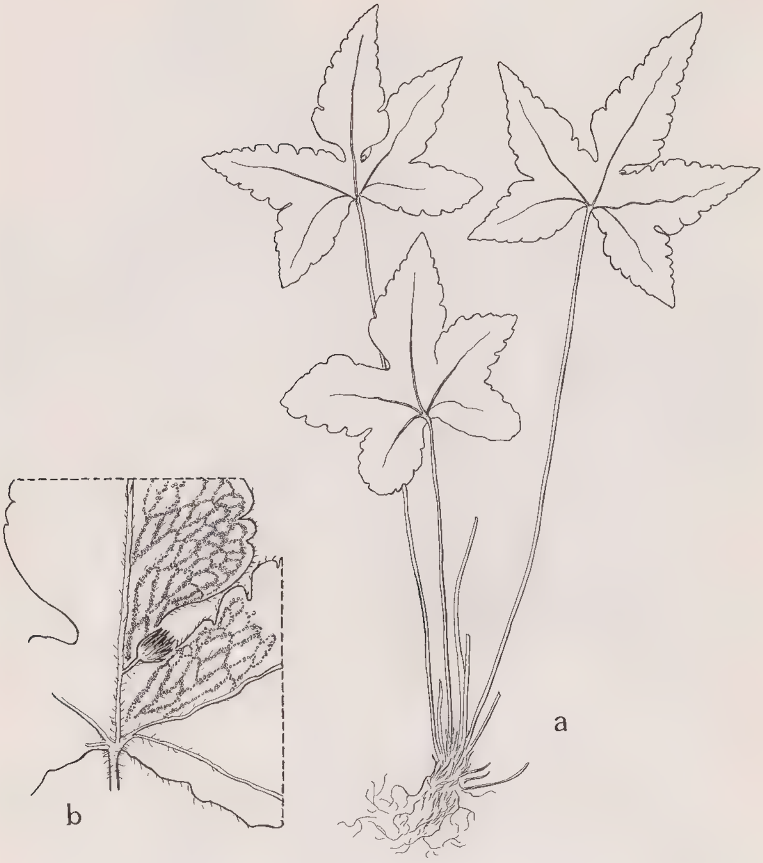

FIGURE 33. **Hemionitis.** a, b, *H. palmata*: a, habit, × 0.5; b, enlarged area of blade showing venation and viviparous bud at base of apical lobe, × 1.5.

General Distribution: Greater Antilles, continental tropical America from Mexico to Bolivia.

Distribution in Lesser Antilles: St. Martin, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On shaded banks, ledges, and boulders at lower to middle elevations.

DORYOPTERIS John Smith

Doryopteris J. Smith in J. Bot. 3: 404, 4: 162. 1841. Figure 34.

Small terrestrial ferns. Rhizomes decumbent to erect, scaly at apex; stipes usually lustrous black or purple-black. Blades usually pedately divided, sometimes entire or 3-lobed (but in some species only in the smaller fronds), rarely palmate or pinnate; venation free or reticulate. Sori marginal, continuous, protected by an indusium formed by the greatly modified reflexed margin of the frond; paraphyses usually present. Sporangia with annulus of 14–22 cells; spores tetrahedral-globose, nearly smooth.

Type species: *Doryopteris palmata* (Willd.) J. Smith, now considered a variety of *D. pedata* (L.) Fée, of South America.

A pantropical genus of about 25 species, most numerous in Brazil; two are recorded from the Lesser Antilles.

Special literature: R. Tryon, A revision of the genus *Doryopteris*, in Contr. Gray Herb. **143**: 1–80. 1942.

Key to the Species

a. Veins all (or nearly all) free .... 1. *D. concolor*
a. Veins completely reticulate .... 2. *D. pedata*

1. **Doryopteris concolor** (Langsd. & Fischer) Kuhn in von der Decken, Reisen in Ost-Afrika 3(3): 19. 1879.

Basionym: *Pteris concolor* Langsd. & Fischer, Ic. Fil. 19, *t. 21.* 1810.
Type: *Langsdorf*, from Nucahiva Island, Marquesas Archipelago.

Rhizome short, erect, the lance-attenuate scales with dark central band and pale margins; stipes nearly glabrous, usually wing-angled, sometimes grooved. Fronds not dimorphic, the fertile fronds 5–34 cm. long. Sterile blades with hydathodes on the upper surface; fertile blades 3–15 cm. long, mostly 2- to 3-pinnatifid, pentagonal in outline, with numerous ultimate segments, these usually acute or acuminate. Soral lines usually broken by the sinuses; spores rugulose.

General Distribution: Pantropical.

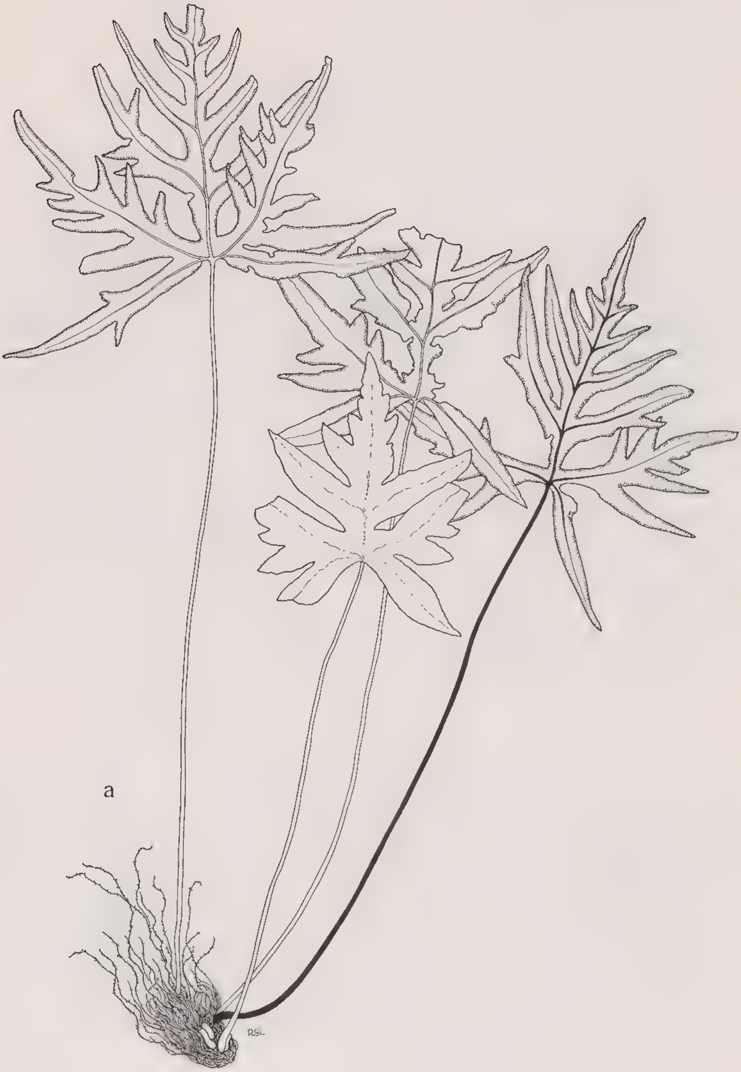

FIGURE 34. **Doryopteris.** a, *D. pedata*, habit, × 0.4.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, Grenadines (Union), Grenada.

HABITAT: Dry rocky hillsides and cliffs.

2. **Doryopteris pedata** (L.) Fée, Mém. Fam. Foug. **5**: 133. 1852.

Basionym: *Pteris pedata* L., Sp. Pl. 2: 1075. 1753.
Type: LINN *1246.11*, from the West Indies without definite locality.

Rhizome short, slender to stout, decumbent to erect, the lance-attenuate scales with black median band and pale margins; stipes usually finely pubescent on one side, wing-angled or grooved. Fronds moderately dimorphic, coriaceous, the fertile fronds 8–50 cm. long. Sterile blades with hydathodes on upper surface and with crenate or crenulate margins; fertile blades 5–21 cm. long, usually 2- to 3-pinnatifid, pentagonal in outline, with few to rather numerous deltate to lanceolate ultimate lobes or segments, the basal primary segments often much larger than the second pair. Soral lines often (but not always) broken by the sinuses.

GENERAL DISTRIBUTION: Greater Antilles, St. Thomas. Other varieties occur in Central and South America, and in the Galapagos Islands.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Montserrat, Guadeloupe, Dominica, Martinique.

HABITAT: Shaded rocky or crumbling banks, usually in ravines or gullies, at chiefly moderate elevations.

CHEILANTHES Swartz

Cheilanthes Sw., Syn. Fil. 126. 1806. FIGURE 35.

Small terrestrial or epipetric ferns. Rhizomes short-creeping, bearing scales. Fronds clustered, erect, often glandular, hairy, or scaly. Blades 1- to 4-pinnate, or 1-pinnate and variously pinnatifid; ultimate divisions often minute; rhachis and costae terete, not winged, the veins free, simple or forked. Sori marginal, originating from the enlarged tips of veins, usually numerous and narrowly confluent, protected by membranous to scarious indusia formed by the reflexed, modified margin. Sporangia with annulus of 14–24 cells; spores globose-tetrahedral and smooth, granulose, or sometimes corrugated.

TYPE SPECIES: *Cheilanthes tenuifolia* (Burm.) Sw., based on *Trichomanes tenuifolia* Burm., of tropical Asia, Indonesia, Polynesia, Australia, and New Zealand.

A worldwide genus of more than 125 species, of which but one is known to occur in the Lesser Antilles.

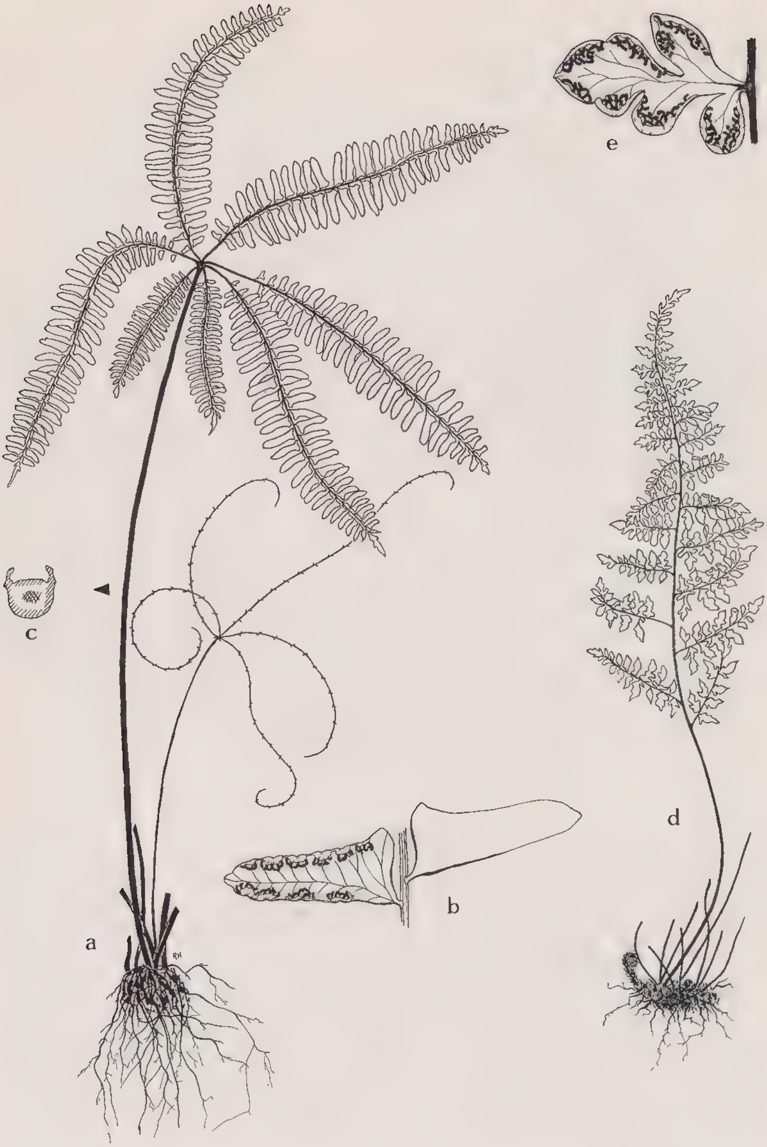

FIGURE 35. **Adiantopsis** and **Cheilanthes.** a–c, *A. radiata*: a, habit (smaller frond lacking deciduous pinnules), × 0.4; b, enlarged pinnule, showing venation and sori, × 2.0; c, cross-section of rhachis, the upper side 2-winged, × 18.5. d, e, *C. microphylla*; d, habit, × 0.4; e, pinnule, showing venation and marginal sori, × 3.0.

1. **Cheilanthes microphylla** (Sw.) Sw., Syn. Fil. 127. 1806; Griseb., Fl. Br. W. Ind. 667. 1864.

Basionym: *Adiantum microphyllum* Sw., Prodr. 135. 1788.
Type: *Swartz*, from Jamaica (BM, isotype).
Syn.: *Cheilanthes elongata* Kaulf., Enum. Fil. 213. 1824. (Type from Hispaniola.)
Cheilanthes microphylla var. *elongata* (Kaulf.) Duss, Foug. & Lyc. Antill. Franc. 65. 1903.

Rhizome short-creeping, the scales soft, narrowly linear, and pale yellowish- or reddish-brown. Fronds 20–60 cm. long; stipes wiry, black, nearly as long as the blades, bearing a few hairlike scales near the base. Blades linear-lanceolate to lance-deltate, 10–45 cm. long, 3–12 cm. broad, 2- to 3-pinnate; rhachis and other vascular parts wiry, black, and pubescent chiefly on one side; pinnules simple, lobate or pinnate; ultimate segments 3–7 mm. long, oval to auriculate-oblong, sparsely whitish-pubescent beneath.

GENERAL DISTRIBUTION: Southeastern United States, Greater Antilles, Cayman Islands, Mexico; closely related forms occur in South America.

DISTRIBUTION IN LESSER ANTILLES: St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Les Saintes (Terre-de-Haut), Martinique, St. Vincent, Grenadines (Bequia).

HABITAT: Walls, rocky banks, and limestone ledges at lower and middle elevations, in both dry and moist districts.

ADIANTOPSIS Fée

Adiantopsis Fée, Mém. Fam. Foug. **5**: 145. 1852. FIGURE 35.

Terrestrial ferns of cliffs and stony forests. Rhizomes erect or decumbent, scaly at the apex. Fronds erect, of stiff texture, the vascular parts lustrous black, wiry, and glabrous. Blades 1- to 4-pinnate, linear or lanceolate to ovate-pentagonal, or radiate-pinnate and orbicular in outline; rhachis and costae 2-winged on upper side throughout, the channel between appearing to be a groove; pinnules deciduous, the veins few, immersed, free. Sori terminal on veins, small and distant; indusium a sharply reflexed, membranous, marginal lobule.

TYPE SPECIES: *Adiantopsis paupercula* (Kunze) Fée, based on *Adiantum pauperculum* Kunze of the Greater Antilles.

A small tropical American genus of about 15 species, one of these being found in the Lesser Antilles. This group is sometimes considered not separable from *Cheilanthes*, but the wing-channeled vascular parts and deciduous pinnules seem to be distinctive.

1. **Adiantopsis radiata** (L.) Fée, Mém. Fam. Foug. 5: 145. 1852.

Basionym: *Adiantum radiatum* L., Sp. Pl. 2: 1094. 1753.
Type: LINN *1252.1*, from an unknown locality.
Syn.: *Cheilanthes radiata* (L.) R. Br. ex J. Smith in J. Bot. 4: 159. 1841; Griseb., Fl. Br. W. Ind. 667. 1864.
Hypolepis radiata (L.) Hook., Sp. Fil. 2: 72, *t. 91-a.* 1852.

Rhizome short, erect, the apex densely clothed with stiff, lance-linear, bicolorous scales, these with black central stripe and brown margins, mostly 1.5–2.5 mm. long. Fronds 20–50 cm. long; stipes often longer than the blades, up to 40 cm. long. Blades 2-pinnate; usually 7 or 9 pinnae radiate from top of the stipe, unequal, the largest 9–23 cm. long and 1–2.5 cm. broad, the smallest much shorter than the others; pinnules numerous, spreading, oblong or linear-oblong, 5–14 mm. long, 1.5–3.5 mm. broad, auriculate at base on acroscopic side, the basal margin parallel to the costa, articulate-stalked and eventually deciduous, with veins simple (except basal ones).

GENERAL DISTRIBUTION: Greater Antilles except Puerto Rico; Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

HABITAT: Stony forests at lower to middle elevations; plants uncommon.

ADIANTUM Linnaeus

Adiantum L., Sp. Pl. 2: 1094. 1753. FIGURE 36.

Terrestrial ferns of forest slopes, shady ravines, and rocky banks. Rhizomes short and suberect to slender and wide-creeping, bearing numerous narrow scales especially near the apex. Fronds usually distichous on the rhizome; stipes wiry, dark, and usually highly lustrous. Blades suberect to deflexed or drooping, 1- to 5-pinnate (rarely simple), of various patterns of dissection, glabrous to minutely pubescent or distantly stellate-scaly, often glaucous beneath, but rarely glandular; pinnules sessile or stalked, often articulate, deciduous in many species, in texture membranous to coriaceous, with veins free in most species, often flabellately branched. Sori appearing marginal, in fact the sporangia borne along (and sometimes between) the ends of the ultimate veins, on the underside of the sharply reflexed, membranous margin (herein called the "indusioid flap") of the pinnules or segments; annulus of about 18 cells; spores tetrahedral (varying to bilateral), dark, smooth.

TYPE SPECIES: *Adiantum capillus-veneris* L., of almost worldwide distribution except in very cold regions.

A large pantropical genus of about 200 species, most numerous in South America, a few extending into temperate regions. Many of them are

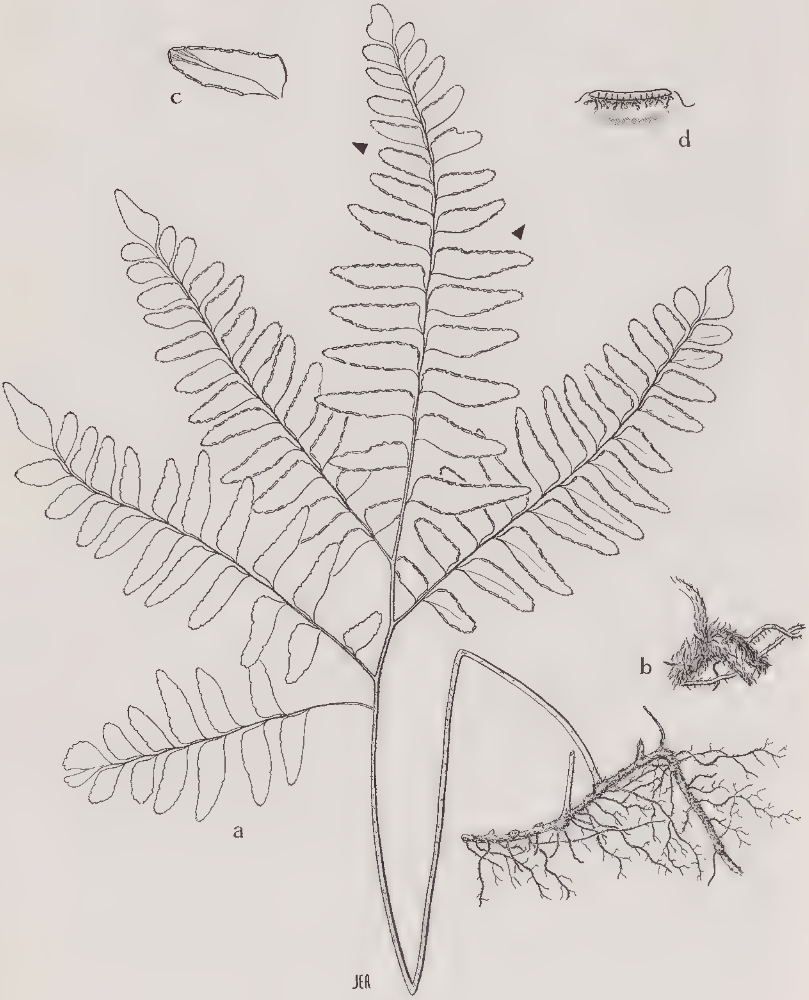

FIGURE 36. **Adiantum.** a–d, *A. latifolium*: a, habit, × 0.4; b, section of rhizome bearing numerous narrow scales, × 1.2; c, pinna, showing venation and sori covered by indusioid flap, × 0.6; d, sporangia on underside of indusioid flap, × 3.2.

commonly called "maidenhair ferns." The name *Adiantum* is of Greek origin and means unwetted, referring to the rain-shedding quality of the foliage in many species.

KEY TO THE SPECIES

- a. Blades 1-pinnate.
  - b. Fronds with naked flagelliform tips, often rooting at the apex; sori isolated on small separate lobes of the pinnae; cultivated and sometimes escaping, native to tropical Africa and Asia .... (*A. caudatum* L.)
  - b. Fronds not flagelliform at the apex, nor proliferous.
    - c. Sporangia borne in a continuous (or nearly so) line along both margins of the pinnae.
      - d. Rhachis glabrous; fertile pinnae in 3–8 pairs, normally more than 2 cm. broad .... 1. *A. macrophyllum*
      - d. Rhachis rusty-hirsute; fertile pinnae in 9–15 pairs, less than 2 cm. broad .... 2. *A. lucidum*
    - c. Sporangia always in separate, adjacent, oblong to shortly linear sori.
      - e. Pinnae glaucous beneath, the sterile ones evenly serrulate-denticulate .... 3. *A. petiolatum*
      - e. Pinnae dark green on both sides, the sterile ones deeply and unevenly biserrate .... 4. *A. obliquum*
- a. Blades 2- to 5-times pinnate.
  - f. Blades with an elongate terminal pinna essentially like the lateral ones (or sometimes larger).
    - g. Basal pinnae evenly 1-pinnate.
      - h. Sporangia borne in a continuous line.
        - i. Fertile pinnules mostly less than 1.5 cm. long, oblong-falcate, the sorus occupying only the acroscopic margin, not reaching the roundish apex .... 5. *A. pulverulentum*
        - i. Fertile pinnules mostly 2–4 cm. long, rhombic, the sorus usually extending around the acuminate or somewhat acute apex .... 6. *A. villosum*
      - h. Sporangia borne in several to numerous short, adjacent, separate sori.
        - j. Pinnules glaucous beneath.
          - k. Rhizome wide-creeping, ca. 2 mm. thick; fertile pinnules obtuse to acute (rarely short-acuminate), the base not overlapping the costa .... 7. *A. latifolium*
          - k. Rhizome short-creeping, 3–7 mm. thick; fertile pinnules mostly long-acuminate, the broadly rounded acroscopic side of base often overlapping the costa ...... 3. *A. petiolatum*
        - j. Pinnules dull to dark green on both sides.
          - l. Rhizome nodose-creeping, up to 8 mm. thick; pinnae 2–6 pairs; pinnules more than 12 pairs per pinna.
            - m. Costae terete, the pinnules not decurrent .... 6. *A. villosum*
            - m. Costae angled, each pinnule decurrent into a winglike flange .... 8. *A. tetraphyllum*
          - l. Rhizome cordlike, 2–4 mm. thick; fronds usually 1-pinnate, but the basal pinnae sometimes elongate and bearing up to 7 pairs of acuminate pinnules .... 4. *A. obliquum*

g. Basal pinnae forked, normally producing a short to elongate pinnate basal pinnule on basiscopic side (or at least a vestige of same) . . . . 9. *A. pyramidale*

f. Blades decompound, lacking an elongate conform terminal pinna.

  n. Pinnae sessile, a basal pinnule of each always overlying the rhachis . . . . 10. *A. concinnum*

  n. Pinnae distinctly stalked.

    o. Sori orbicular or suborbicular, each located at a deep narrow notch in the margin; stalks of ultimate pinnules pale brown, not articulate, introduced and naturalized, native to South America . . . . 11. *A. raddianum*

    o. Sori oblong or lightly curved, each located on a small lobe of the margin; stalks of ultimate pinnules black.

      p. Blades 2- to 3-pinnate; stalks of ultimate pinnules not articulate, their blades persistent; rhizome scales glabrous, entire . . . . 12. *A. capillus-veneris*

      p. Blades 3- to 5-pinnate; stalks of ultimate pinnules articulate at the apex, their blades soon or eventually deciduous; rhizome scales with marginal hairs.

        q. Rhizome scales bright yellowish-brown, ciliolate; blades lance-oblong; ultimate pinnules quickly deciduous . . . . 13. *A. fragile*

        q. Rhizome scales dark brown with pale, ciliate or fimbriate margins; blades deltate-ovate, subpentagonal; ultimate pinnules subpersistent . . . . 14. *A. tenerum*

1. **Adiantum macrophyllum** Sw., Prodr. 135. 1788.

Type: *Swartz*, from Jamaica.

Rhizome short-creeping, 4–7 mm. thick, the apex bearing a tuft of small, dull brown, narrowly deltate-linear scales. Fronds closely distichous, erect to spreading; stipes lustrous black, glabrous, 15–30 cm. long. Blades oblong to ovate-oblong, 15–30 cm. long, 10–20 cm. broad; pinnae 3–8 pairs and a terminal one, glabrous, subglaucous beneath, 2.5–5 cm. broad near the base; basal pinnae (1 or 2 pairs) broadly deltate from a truncate or shallowly cordate base; upper pinnae of fully fertile blades narrowly deltate from an inequilateral rectangular base, sessile; sterile pinnae with margins irregularly incised or shallowly lobed, all pinnae with acute to acuminate apices and veins free, repeatedly dichotomous, a faint costa scarcely differentiated. Sori continuous or nearly so, in a heavy line along both margins of fertile pinnae, but not reaching the apex; indusioid flap pale brown, membranous, subentire.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to South America.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Moist, shaded rocky banks and ravines.

In this species, as in many others of the same genus, the young developing fronds are red in color, changing to green as they mature.

2. **Adiantum lucidum** Sw., Syn. Fil. 121. 1806, not *Pteris lucida* Cav., 1802; Hook., Sp. Fil. 2: 4, *t. 79, fig. c.* 1851.

Type: From Peru (no collector cited).
Syn.: *Adiantum obliquum* Willd. [var.] *β lucidum* (Sw.) Griseb., Fl. Br. W. Ind. 663. 1864.

Rhizome creeping, 3–6 mm. thick, the apex bearing a dense tuft of small, dark iridescent brown, clathrate, deltate-attenuate scales. Fronds closely distichous, erect; stipes lustrous dark purple-brown, slightly scabrous, deciduously rusty-hirsute, 12–30 cm. long. Blades lance-oblong, mostly 15–25 cm. long, 8–14 cm. broad; rhachis rusty-hirsute throughout; pinnae of fertile blades 9–15 pairs and an acuminate terminal one; lateral pinnae rhombic-lanceolate, simple (rarely the lowest pinnate), mostly 4–8 cm. long and 1–2 cm. broad above the base, short-stalked, long-acuminate, glabrate; tissue coriaceous, dark glossy green, with veins obliquely flabellate from a slender midvein, free or rarely anastomosing near the margins; sterile margins finely denticulate except along the broadly cuneate inequilateral base. Sori continuous or subcontinuous along both margins except near the base and apex; indusioid flap pale brown, minutely fimbriate.

General Distribution: Trinidad, Panama, South America.

Distribution in Lesser Antilles: Antigua; Guadeloupe, *L'Herminier* (p).

Habitat: Terrestrial in wet forests at low to middle elevations; plants very rare in the Lesser Antilles.

3. **Adiantum petiolatum** Desvaux in Ges. Naturf. Freunde Berlin Mag. 5: 326. 1811.

Type: From "Gallia aequinoctiali Brasiliaque"; at the time of this writing, Desvaux's specimen had not been located among his materials at Paris.
Syn.: *Adiantum obliquum* sensu Kaulf., Enum. Fil. 200. 1824, not Willd. in L., 1810.
Adiantum kaulfussii Kunze in Linnaea **21**: 221. 1848; Griseb., Fl. Br. W. Ind. 663. 1864.
Adiantum denticulatum sensu Krug in Engl. Bot. Jahrb. **24**: 92. 1897, not Sw., 1788.

Rhizome short-creeping, 3–7 mm. thick, bearing toward the apex a dense tuft of lustrous light brown, subclathrate, entire (or rarely denticulate near base), narrowly lance-attenuate scales chiefly 2–3 mm. long. Fronds closely distichous, erect or ascending, 25–60 cm. long; stipes shining black, slender, glabrous, 10–40 cm. long. Blades oblong to deltate-oblong, 15–25 cm. long, 6–12 cm. broad; rhachis like the stipe; pinnae 4–12 pairs and a terminal one, simple (rarely the basal ones pinnate), inequilateral, the lower ones short-stalked, lance-deltate, rounded at the upper (acroscopic) side and usually overlying the rhachis, deeply excavate on the basiscopic side; middle and upper pinnae oblong-lanceolate, long-acuminate (or the sterile ones obtuse or somewhat acute); tissue thinly papery, very glaucous beneath, the veins obliquely flabellate from a slender midvein; sterile margins evenly serrulate-denticulate. Sori several to many along both margins, linear, arcuate, adjacent; indusioid flap brown, minutely fimbriate.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Bolivia and Brazil.

Distribution in Lesser Antilles: Guadeloupe, Martinique, Grenada.

Habitat: Moist forests and shaded clay banks at chiefly lower elevations.

4. **Adiantum obliquum** Willd. in L., Sp. Pl. **5**: 429. 1810; Griseb., Fl. Br. W. Ind. 663. 1864, in part, excl. vars. & ref. Swartz.

Lectotype: *Bredemeyer, Herb. Willd. 20067, sheet 1*, from Caracas, Venezuela (B).

Syn.: *Adiantum triangulatum* sensu Hook., Sp. Fil. 2: 26. 1851, not Kaulf., 1824.

Rhizome creeping, 2–4 mm. thick, bearing (especially toward the apex) numerous lustrous brown or yellow-brown, denticulate, narrowly deltate-attenuate scales up to 3 mm. long, these not at all clathrate. Fronds closely distichous, stiffly erect, 25–70 cm. long; stipes shining purple-black, angulate, deciduously furfuraceous, 12–40 cm. long. Blades oblong to deltate-lanceolate, 10–30 cm. long, 7–15 cm. broad at base; rhachis like the stipe; pinnae 8–13 pairs and a subhastate terminal one, simple (or sometimes the lowest pinnate), short-stalked, inequilateral, the fertile ones narrowly oblong-lanceolate or narrowly deltate, evenly narrowed to the rounded or somewhat acute tip, the base rounded-rectangular on the acroscopic side, the basiscopic side excavate; tissue papery, glabrate, dark glossy green, the veins obliquely flabellate from a slender midvein; sterile margins obscurely crenate and finely denticulate to unevenly biserrate except on basiscopic side near the base. Sori several to numerous along both margins, discrete, straight or subarcuate; indusioid flap dark brown, minutely denticulate.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Bolivia and Brazil.

Distribution in Lesser Antilles: Guadeloupe, Martinique, St. Lucia, Grenada.

Habitat: Wet forests and partly shaded banks along streams, chiefly at lower to middle elevations.

5. **Adiantum pulverulentum** L., Sp. Pl. 2: 1096. 1753; Griseb., Fl. Br. W. Ind. 665. 1864.

Lectotype: Plumier, Descr. Pl. Amer. *t. 47* (= Tr. Foug. *t. 55*), based on a plant from Martinique or Hispaniola.

Syn.: *Adiantum monosoratum* Willd. in L., Sp. Pl. 5: 445. 1810. (Type from Venezuela.)

Rhizome short-creeping, 5–9 mm. thick, nodose, clothed at the apex with a small tuft of narrowly lance-attenuate, clathrate, denticulate or ciliolate scales. Fronds closely distichous, suberect, 30 to more than 100 cm. long; stipes 15–60 cm. long, quadrangular, grooved, shining purple-black, lightly clothed with minute, brown, branlike scales. Blades roundish- to deltate-oblong, mostly 25–50 cm. broad, 2-pinnate; lateral pinnae 3–8 pairs, alternate, spreading, linear to narrowly oblong-lanceolate, mostly 15–25 cm. long, the apex acuminate; pinnules numerous, close, spreading, subsessile, dimidiate, sparsely and minutely stellate-scaly beneath, the fertile ones narrowly oblong, 8–15 mm. long, straight or subfalcate, the tip usually rounded, upcurved, and denticulate-serrate. Sori usually solitary, linear along the acroscopic margin, not reaching the tip; indusioid flap firm, light brown, with finely erose margin.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Shady banks and forested slopes at low to middle elevations.

6. **Adiantum villosum** L., Syst. Nat. ed. 10, 2: 1328. 1759; Griseb., Fl. Br. W. Ind. 664. 1864.

Type: Presumably a specimen at one time in the herbarium of Linnaeus, now no longer extant. The specimen marked "*Adiant. villosum*" in the Linnaean Herbarium (*1252.10*) is the species we are calling *A. pulverulentum* and may have been a later insertion. Linnaeus cited "Pluk. phyt. *t. 253*, *f. 1*," but this plate (later cited by Lamarck as one of the elements illustrating his *A. latifolium*, q.v.) also does not fit the Linnaean diagnosis and must be excluded. The traditional and correct application of the name "villosum" can be represented by a specimen in the Sloane Herbarium (BM-*Sloane*, *Herb.* vol. 1, p. 127), which was the basis of his illustration in Nat. Hist. Jamaica (vol. 1, *t. 55*, *fig. 1*). Sloane's specimen was collected near what is now Spanish Town, Jamaica, and can be designated the neotype of *Adiantum villosum.*

Syn.: *Adiantum falcatum* Sw. in J. Bot. Schrader **1800**(2): 82. 1801.
Adiantum lanceolatum Fée, Mém. Fam. Foug. 5: 118. 1852.
Adiantum oblique-truncatum Fée, Mém. Fam. Foug. 11: 18, *t. 7*, *fig. 3* (incorrectly cited in Fée's text as *fig. 2.*) 1866. (Type from Guadeloupe.)

Rhizome short-creeping, 5–8 mm. thick, strongly nodose, clothed at the apex with brown, narrowly attenuate, denticulate scales. Fronds closely distichous, stiffly ascending, 50–100 cm. long; stipes 35–60 cm. long, stout, angled, shining purple-black, deciduously clothed with minute brown denticulate scales. Blades ovate or (excluding the elongate terminal pinna) transversely oblong, 25–40 cm. long, 25–50 cm. broad, 2-pinnate; lateral pinnae 2–6 pairs, alternate, spreading, lance-oblong to linear, to 30 cm. long; pinnules numerous, mostly 2–4 cm. long, 0.7–1 cm. broad, the fertile ones strongly inequilateral, more or less rhombic-oblong with abruptly acute or acuminate tips, the sterile ones sharply biserrate. Sori borne along the acroscopic side and around the tip, normally continuous, or sometimes interrupted and arcuate.

General Distribution: Greater Antilles, Virgin Islands, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: Antigua, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenadines (Bequia), Grenada.

Habitat: Shaded rocky banks at lower elevations.

7. **Adiantum latifolium** Lam., Encycl. Méth. Bot. 1: 43. 1783, excl. refs. Sloane & Plukenet.

Type: Apparently no specimen or valid illustration is extant; the application of the name must apparently be based solely on Lamarck's description. In order to ensure that the name *Adiantum latifolium* is maintained in its traditional sense, *Proctor 20110*, from Guadeloupe (A), is designated neotype.

Lamarck cited Plukenet, Alm. Bot. Mant. *t. 253, fig. 1*, based on material from Jamaica, but this specimen, now in the Sloane Herbarium at the British Museum, is the species known as *Adiantum kendalii* Jenman. Lamarck's other cited plate, Sloane, Nat. Hist. Jamaica 1: *t. 55, fig. 1*, is *Adiantum villosum* L.

Syn.: *Adiantum denticulatum* Sw., Prodr. 135. 1788, not Burm., 1768.
Adiantum elatum Desvaux in Ges. Naturf. Freunde Berlin Mag. 5: 327. 1811. (Type found "in caribeis.")
Adiantum triangulatum Kaulf., Enum. Fil. 204. 1824.
Adiantum fovearum Raddi, Pl. Bras. Fil. 1: 58, *t. 77.* 1825; Husnot, Cat. Crypt. Antill. Franc. 33. 1870.
Adiantum intermedium sensu Hook., Sp. Fil. 2: 25. 1851, not Swartz, 1817.

Rhizome wide-creeping and cordlike, ca. 2 mm. thick, clothed at apex with dark brown, narrowly attenuate, entire or remotely denticulate scales. Fronds rather distant, ascending, 30–95 cm. long; stipes 20–55 cm. long, deeply grooved, shining purple-brown, nearly naked. Blades deltate to suborbicular or (excluding the terminal pinna) transversely oblong, 10–40 cm. long, 15–40 cm. broad, 2-pinnate; lateral pinnae 1–4 pairs, alternate, spreading, narrowly oblong to ovate-oblong, to 20 cm. long, acuminate; costae finely scaly; pinnules numerous, usually glaucous beneath, inequilateral, 2–4.5 cm. long, 0.7–1.5 cm. broad, the fertile ones obliquely oblong-lanceolate, rounded-rectangular acroscopically at base, widely excavate on basiscopic side, the apex acute or acuminate, the sterile pinnules larger than the fertile, sharply denticulate on margins. Sori numerous, narrowly oblong, close, occurring along the acroscopic margin and around the apex to outer part of basiscopic margin.

GENERAL DISTRIBUTION: Greater Antilles, Virgin Islands, Trinidad, continental tropical America from Mexico to South America.

DISTRIBUTION IN LESSER ANTILLES: Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, Grenada, Barbados.

HABITAT: Partly shaded banks, borders of pastures and alluvial thickets at low to middle elevations.

8. **Adiantum tetraphyllum** Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 441. 1810, sensu lato.

Lectotype: *Humboldt, Herb. Willd. 20082, sheet 2*, from Caripe, Venezuela (B).

Syn.: *Adiantum prionophyllum* Humb. & Bonpl. ex Kunth, Nov. Gen. & Sp. **1**: 20. 1815.

Adiantum fructuosum Poeppig ex Sprengel in L., Syst. Veg. **4**: 113. 1827. (Type from Cuba.)

Synaphlebium tetraphyllum (Humb. & Bonpl. ex Willd.) Fée, Mém. Fam. Foug. **5**: 109. 1852.

Adiantum intermedium sensu Griseb., Fl. Br. W. Ind. 664. 1864, not Swartz, 1817.

Adiantum tetraphyllum var. *subsimplex* Christ in Engl. Bot. Jahrb. **24**: 95. 1897. (Syntype: *Eggers 6469*, from Grenada (P).) (This is probably a juvenile form.)

Rhizome creeping, 3–8 mm. thick, becoming strongly nodose with age, densely clothed at apex with dark reddish-brown, narrowly attenuate, remotely denticulate scales. Fronds rather closely distichous to somewhat distant, erect, 35–100 cm. long; stipes 20–60 cm. long, grooved-quadrangular, shining purple-black, sparsely clothed with minute, brown, cobwebby scales. Blades broadly deltate to suborbicular or (excluding the enlarged terminal pinna) transversely oblong, 15–40 cm. long, 15–40 cm. broad, 2-pinnate (mostly 1-pinnate in var. *subsimplex*); lateral pinnae 2–6 pairs, alternate, spreading, mostly linear-lanceolate, to 22 cm. long, acuminate-caudate; pinnules numerous, dark green, the fertile pinnules oblong to narrowly deltate-oblong, mostly 1.5–2.5 cm. long, 0.6–0.8 cm. broad, broadly cuneate at base, the acroscopic base rectangular, the basiscopic margin cut away in a straight line (without sori) ca. 2/3 or more to the somewhat acute or acuminate apex, the sterile pinnules larger and more falcate, the margins coarsely appressed-serrate. Sori numerous, short, distinctly separate.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to South America.

Distribution in Lesser Antilles: Antigua, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Moist shaded ravines and forest slopes at chiefly middle elevations.

This is a polymorphic species as here accepted in an inclusive sense; several segregates are recognized by some authors, but the characters used to distinguish these forms do not seem well correlated.

9. **Adiantum pyramidale** (L.) Willd. in L., Sp. Pl. **5**: 442. 1810.

Basionym: *Polypodium pyramidale* L., Sp. Pl. **2**: 1093. 1753.

Type: Petiver, Fil. *t. 4, fig. 2,* copied from Plumier, Tr. Foug. *t. 54,* based on a plant from Grand Cul-de-sac, near Léogane, Haiti. Plumier's *t. 53* and *t. 97* also represent different forms of the same species; superficially these look very different, but the abundant herbarium material now available shows every possible intergradation between them. Although this species has customarily been called *Adiantum cristatum* L., is now seems necessary to replace it with the older name *A. pyramidale*, even though this name unfortunately is based on a form that is far from "typical" of the species as a whole.

Syn.: *Adiantum cristatum* L., Syst. Nat. ed. 10, **2**: 1328. 1759. (Type from Hispaniola.)
Adiantum striatum Sw., Prodr. 135. 1788; Schkuhr, Krypt. Gew. *t. 118, figs. a–g.* 1806. (Type from Jamaica.)
Adiantum crenatum Willd. in L., Sp. Pl. **5**: 446. 1810. (Type from Hispaniola.)
Adiantum quadriternatum Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 327. 1811.
Adiantum microphyllum Kaulf., Enum. Fil. 204. 1824. (Type from Cuba.)
Adiantum nigrescens Fée, Mém. Fam. Foug. **5**: 117. 1852, **7**: 28, *t. 11, fig. 2.* 1857. (Type from Hispaniola.)

Rhizome short-creeping, to 7 mm. thick, clothed with pale brownish, narrowly attenuate-filiform scales. Fronds usually closely distichous, erect, 30–100 cm. long; stipes equalling or longer than the blades, dull purple-brown to blackish, minutely spiny, sparsely clothed with a few deciduous hairlike scales. Blades lance-oblong to broadly deltate-ovate or subpentagonal, 20–45 cm. long, 12–30 cm. broad, 2-pinnate except for the 3-pinnate base (the lowest pair of pinnae each usually bearing a pinnate, short to rather elongate pinnule at base on basiscopic side, or rarely 2 or more such compound pinnules); lateral pinnae 2–11 pairs, alternate, distant, oblique, mostly linear-attenuate; pinnules numerous, close, dull dark green, rigidly herbaceous to subcoriaceous, striate, rhombic-oblong to rhombic-ovate, mostly 7–15 mm. long, 4–7 mm. broad, broadly cuneate at base, short-stalked, the fertile ones rounded-obtuse or somewhat acute at the apex, the sterile ones subfalcate, acuminate, and with margins obscurely dentate-serrulate to subentire. Sori oval to oblong, nearly straight, borne chiefly along the acroscopic margin and around the apex.

General Distribution: Greater Antilles, St. Thomas.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Martinique.

Habitat: Shaded rocky banks and wooded hillsides at lower to middle elevations; plants rare in our area.

10. **Adiantum concinnum** Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 451. 1810.

Lectotype: *Humboldt, Herb. Willd. 20099, sheet 2*, from Cumana, Venezuela (B).

Rhizome short-creeping, to 15 mm. thick, densely clothed with concolorous bright brown, narrowly lance-attenuate, entire scales. Fronds clustered, usually drooping or pendent, 20–95 cm. long; stipes much shorter than the blades, terete, shining reddish-brown to purple-black, glabrous. Blades lanceolate to lance-oblong or deltate-oblong, 15–70 cm. long, 6–25 cm. broad, usually attenuate at apex, 2- to 3-pinnate; pinnae numerous, laxly ascending, close, alternate, deltate, to 15 cm. long; tissue yellowish-green to dark green, glabrous; pinnules rhombic-obovate to broadly trapeziform, 5–15 mm. long, short-stalked (stalks not articulate), incised-lobate, the fertile lobes deeply emarginate, each bearing a pair of orbicular-reniform sori, the sterile segments denticulate, the veinlets running to the sinuses.

General Distribution: Greater Antilles, Trinidad, Central and South America.

Distribution in Lesser Antilles: Guadeloupe, Martinique, St. Vincent, Grenada.

Habitat: Steep, shaded rocky banks at low to middle elevations.

The fronds are seasonal, tending to disappear entirely during dry periods.

11. **Adiantum raddianum** C. Presl, Tent. Pter. 158. 1836.

Type: *Langsdorf s.n.*, from Santa Catarina Island, Brazil (BM, B – *Herb. Willd. 20096*, isotypes).

Syn.: *Adiantum cuneatum* Langsd. & Fischer, Icon. Fil. 23, *t. 26.* 1810, not G. Forster, 1786.

Rhizome short-creeping, branched, clothed with dark brown, lance-attenuate, entire scales to 0.8 mm. long. Fronds close, erect-arching, glabrous, mostly 15–45 cm. long, stipes dark reddish-brown to blackish, naked, equalling or exceeding the blades. Blades deltate or lance-ovate to broadly ovate, to 30 cm. broad (usually less), 3- to 4-pinnate; pinnae and pinnules stalked; ultimate divisions cuneate-flabellate, symmetrical or not, not articulate, the sterile margins with each vein ending in a small notch or sinus. Sori solitary or few on each ultimate pinnule; indusioid flap pale or whitish, more or less orbicular-reniform.

General Distribution: South America (see discussion).

Distribution in Lesser Antilles: Dominica, *Hodge 69* (gh); St. Vincent.

Habitat: Roadside banks and paths at middle elevations, naturalized.

This species has escaped from cultivation at many localities in the American tropics, so that its true natural range is difficult to ascertain. Tryon (Contr. Gray Herb. **194**: 170. 1964) has pointed out that in Peru there exist at least four more or less distinct forms making up a "species-complex" that needs further study.

12. **Adiantum capillus-veneris** L., Sp. Pl. **2**: 1096. 1753.

Type: *Magnol*, linn *1252.9*, from southern France.

Rhizome creeping, cordlike, 2–3 mm. thick, laxly clothed with light brown, lance-linear, entire scales. Fronds laxly ascending or pendent, 20–70 cm. long; stipes as long as the blades or longer, shining purplish-black, glabrous. Blades ovate or lance-ovate, 15–40 cm. long, 8–22 cm. broad, 2- to 3-pinnate at base tapering to the 1-pinnate attenuate apex; pinnae laxly spreading, alternate, stalked; pinnules variable in size and shape, obovate to rhombic or obliquely oblong, 5–30 mm. long, narrowly to broadly cuneate, the outer margin deeply lobed or incised; sterile pinnules with denticulate margins, the teeth acuminate to somewhat acute. Sori solitary on the lobes, mostly oblong-lunate.

General Distribution: Cosmopolitan in tropical, subtropical, and warm-temperate regions.

Distribution in Lesser Antilles: Dominica (reported by Domin); St. Lucia, *Box 1928* (bm, ij); St. Vincent (reported by Domin); Barbados, *Proctor 26248, 26256* (ij).

Habitat: Old walls and moist calcareous banks, especially beside streams; plants rare except in Barbados.

13. **Adiantum fragile** Sw., Prodr. 135. 1788.

Type: *Swartz*, from Jamaica.
Syn.: *Adiantum parvifolium* Fée, Mém. Fam. Foug. **7**: 27, *t. 23, fig. 2.* 1857.

Rhizome short, thick, often several-branched, densely clothed with bright yellowish-brown, lance-attenuate scales. Fronds tufted, ascending, 15–60 cm. long; stipes much shorter than the blades, wiry, terete, shining purple-brown, glabrous. Blades lance-ovate, 10–45 cm. long, 4–18 cm. broad, 3- to 4-pinnate at base; pinnae alternate, stalked, with distant oblique pinnules; ultimate pinnules delicately herbaceous, light green, obovate-cuneate, 7–15 mm. long, 5–10 mm. broad, on stalks 1–3 mm. long, very easily deciduous; sterile pinnules denticulate. Sori subreniform to oblong, borne singly or in pairs on very shallow lobes of the rounded distal margin.

General Distribution: Greater Antilles, Virgin Islands.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Steep rocky banks and shaded limestone cliffs at lower to middle elevations; rarely in crevices of old stone walls.

14. **Adiantum tenerum** Sw., Prodr. 135. 1788.

Type: *Swartz*, from Jamaica.

Rhizome short-creeping, 5–10 mm. thick, densely clothed with lustrous deltate-attenuate scales. Fronds few, close, distichous, erect and spreading or sometimes pendent, 25–110 cm. long; stipes shorter than (or nearly as long as) the blades, terete, shining dark purplish-brown to nearly black, glabrous. Blades deltate-ovate, subpentagonal, 15–70 cm. long, 15–60 cm. broad, 3- to 5-pinnate at base; pinnae alternate, stalked; ultimate pinnules firmly herbacous, close, trapeziform or rhombic-oblong (terminal ones flabellate-cuneate), the fertile ones mostly 1–2 cm. long and broad, on slender stalks 2–4 mm. long, the sterile pinnules often larger than the fertile, deeply lobed or cleft, with margins lightly to sharply dentate. Sori retuse-oblong, borne in pairs on each of the lightly bifid lobes of the fertile margin.

General Distribution: Southern United States, Bahamas, Greater Antilles, Tobago, Trinidad, Central America, northern South America.

Distribution in Lesser Antilles: St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, La Desirade, Marie Galante, Dominica, Martinique, St. Vincent, Grenada, Barbados.

Habitat: Shaded limestone hillsides, rocky banks, cliffs, and crevices of old walls at chiefly lower elevations.

14a. **Adiantum tenerum** var. **farleyense** (T. Moore) André, Illustr. Hort. 19: 64. 1872.

Basionym: *Adiantum farleyense* T. Moore in J. Roy. Hort. Soc. (n. ser.) 1: 82. 1866.

Type: Presumably a specimen from cultivation in England, originating as a wild plant in Barbados on the grounds of Farley Hill, the residence of T. G. Briggs, after which "the fern has been christened as a memento."

This widely cultivated variant, apparently no longer extant as a wild plant, differs from typical *A. tenerum* in its much larger, often crispate-lobate pinnules. It is apparently always sterile and must be propagated vegetatively.

Generally speaking, the *Adiantum tenerum* population in Barbados is more luxuriant in appearance than anywhere else, and occasional plants approaching var. *farleyense* in size of pinnules are not uncommon there.

Doubtful Records

Adiantum cultrifolium J. Smith ex Hook., Sp. Fil. 2: 34. 1858, was based in part on a specimen alleged to have been collected in St. Vincent by Macrae (BM). This dubious taxon was wrongly referred to *A. trapezoides* Fée by Christensen (Ind. Fil. 35. 1905). The Macrae specimen, which represents an unidentified species of the *A. trapeziforme* group, probably originated from a cultivated plant. It has never been found again in the Lesser Antilles, and should not be considered a member of the local flora.

Adiantum obtusum Desvaux "β" Hook., Sp. Fil. 2: 19. 1858. The typical form of this species is the same as *A. serrato-dentatum* Willd., not known to occur in the Lesser Antilles. Hooker's "β," attributed in part to St. Vincent on the basis of a Guilding collection, may have been a form of *A. tetraphyllum*, but one would have to see the original specimen in order to decide this.

Subfamily OLEANDROIDEAE

OLEANDRA Cavanilles

Oleandra Cav. in An. Hist. Nat. (Madrid) 1: 115. 1799. FIGURE 37.

Epiphytic or terrestrial ferns. Rhizomes slender but rather woody, wide-creeping or erect and shrubby, scaly throughout, the scales peltate with attenuate tips. Fronds borne on special short branches ("phyllopodia"), to which the stipes are articulate. Blades simple, entire or nearly so, usually narrow, all alike or dimorphic, the veins free, simple to 2-forked, parallel, very close, all reaching the cartilaginous margins. Sori scattered or borne in longitudinal rows near the costa; indusia reniform (rarely roundish or peltate), attached at the sinus. Sporangia with annulus of 12–14 cells; spores bilateral. Gametophytes hairy.

TYPE SPECIES: *Oleandra neriiformis* Cav., of the Philippine Islands.

A pantropical genus of probably about 50 species, mostly of rather similar aspect, a few remarkable in being the only truly shrublike ferns. One species is recorded from the Lesser Antilles.

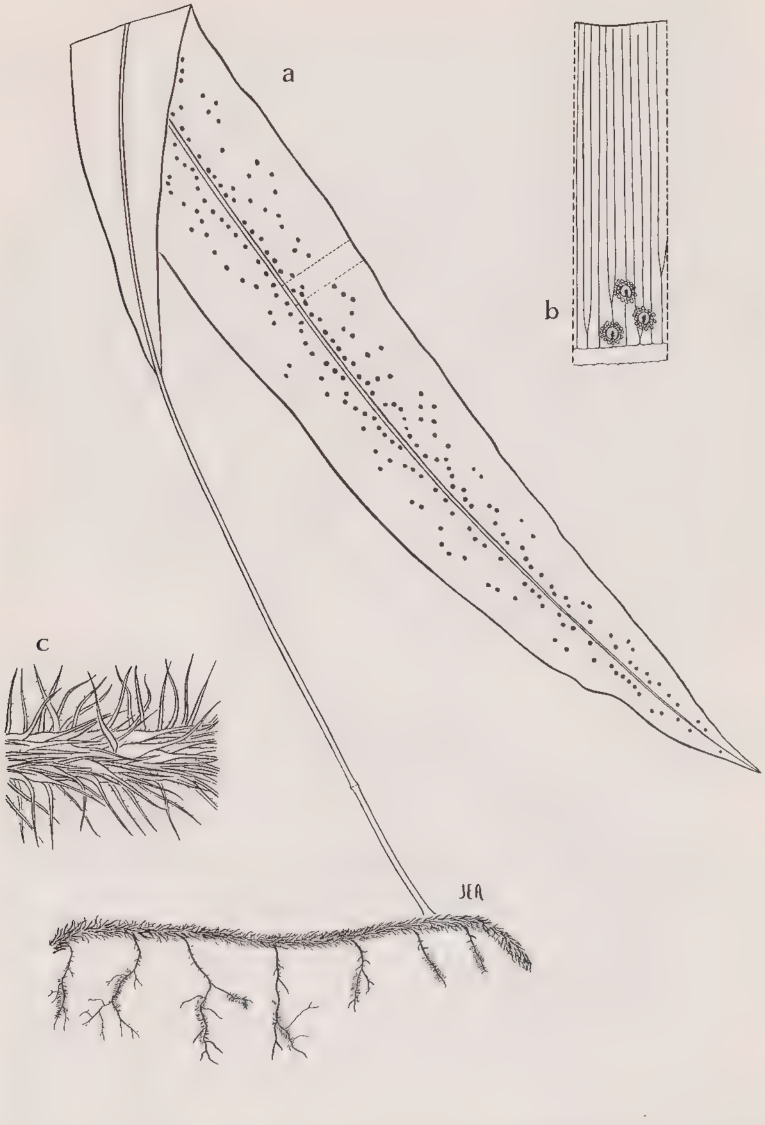

FIGURE 37. **Oleandra.** a–c, *O. nodosa*: a, habit, × 0.5; b, section of blade showing venation and scattered sori, × 1.8; c, section of rhizome showing peltate scales with attenuate tips, × 2.7.

1. **Oleandra nodosa** (Willd.) C. Presl, Tent. Pter. 78. 1836.

Basionym: *Aspidium nodosum* Willd. in L., Sp. Pl. 5: 211. 1810.
Type: Plumier, Tr. Foug. *t. 136*, based on material from Morne Rouge, Martinique.
Syn.: *Oleandra articulata* of many authors as to the tropical American species, not *Aspidium articulatum* Sw., 1801, of Mauritius.

Rhizome 2–4 mm. thick, wide-creeping or scandent, densely scaly, the scales spreading, red-brown, and hair-pointed from a lanceolate base, with margins glandular-ciliolate. Fronds distant, 20–80 cm. long, glabrous throughout; phyllopodia slender, naked, 1–8 cm. long, distinctly articulate at junction with the stipes; stipes much shorter than the blades. Blades lance-linear to oblong, 15–55 cm. long, 3–8 cm. broad, the apex abruptly caudate with taillike tip 1–4 cm. long; tissue papery-membranous, bright green, lustrous, the costa bearing a few cordate-deltate scales beneath. Sori irregularly scattered; indusium glabrous.

General Distribution: Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On tree trunks, mossy logs, and humus-covered banks in rain forests at chiefly middle elevations.

Subfamily DRYOPTERIDOIDEAE

Key to the Genera

- a. Sporangia borne densely scattered all over the tissue (usually on the underside) of special fertile blades or pinnae.
  - b. Sterile blades simple, entire.
    - c. Veins essentially all free (rarely casually joined or joined by a submarginal strand) .... 25. *Elaphoglossum*
    - c. Veins obviously all reticulate .... 26. *Hymenodium*
  - b. Sterile blades variously divided or compound.
    - d. Sterile blades flabellately dissected, the divisions dichotomous .... 24. *Peltapteris*
    - d. Sterile (and fertile) blades pinnately compound.
      - e. Veins reticulate .... 27. *Bolbitis*
      - e. Veins free or united by a submarginal strand only.
        - f. Pinnae articulate to the rhachis .... 28. *Lomariopsis*
        - f. Pinnae not articulate to the rhachis .... 29. *Polybotrya*
- a. Sporangia borne in more or less distinct sori on the underside of ordinary fronds.
  - g. Sori essentially round.
    - h. Pinnae articulate to the rhachis.
      - i. Indusium more or less reniform, attached at the sinus; plants often stoloniferous .... 30. *Nephrolepis*
      - i. Indusium round, peltate; plants not stoloniferous .... 31. *Cyclopeltis*

h. Pinnae not articulate to the rhachis.

j. Veins reticulate.

k. Indusium cup-shaped, fimbriate-ciliate ...... 32. *Hypoderris*

k. Indusium neither cup-shaped nor fimbriate-ciliate; indusium sometimes lacking .... 33. *Tectaria*

j. Veins all free.

l. Fronds bearing articulated (pluricellular) hairs on rhachis and costae.

m. Rhizome erect or nearly so, the fronds fasciculate; fronds always bearing at least a few scales on the vascular parts beneath .... 34. *Ctenitis*

m. Rhizome elongate, creeping, the fronds not fasciculate.

n. Indusium present; rhachis and costae bearing small scattered scales beneath .... *Ctenitis protensa*

n. Indusium lacking; fronds entirely without scales.

o. Hairs of costae minute, mostly 0.1–0.2 mm. long; rhachis often with small, scaly bud .... 35. *Lastreopsis*

o. Hairs of costae to 2 mm. long or more; rhachis never producing a scaly bud ... 36. *Polystichopsis*

l. Fronds lacking true hairs (more or less fibrillose scales present).

p. Fronds not over 20 cm. long, the pinnae spiny-toothed; tissue not pellucid-punctate .... 37. *Polystichum*

p. Fronds to 200 cm. long, the pinnae lobed but not spinescent; tissue with numerous pellucid dots .... 38. *Stigmatopteris*

g. Sori more or less elongate .... 39. *Diplazium*

PELTAPTERIS Link

Peltapteris Link, Fil. Hort. Berol. 147. 1841. FIGURE 38.

Syn.: *Rhipidopteris* Schott ex Fée, Mém. Fam. Foug. **2:** 14. 1845.

Small epiphytic ferns. Rhizomes slender, wide-creeping, scaly. Fronds erect, distant, dimorphic; stipes nonarticulate. Sterile blades flabellate, more or less finely dissected; divisions dichotomous, glabrous or nearly so, with veins free. Fertile blades smaller than the sterile, roundish, cordate, the margins dentate or lobed, covered with sporangia on abaxial side. Sporangia with annulus of about 11 cells; paraphyses absent; spores reniform to ellipsoid, with angular perispore.

TYPE SPECIES: *Peltapteris peltata* (Sw.) Morton, based on *Osmunda peltata* Sw. of the West Indies.

Two other species, both South American, are also known.

1. **Peltapteris peltata** (Sw.) Morton in Amer. Fern J. **45:** 13. 1955.

Basionym: *Osmunda peltata* Sw., Prodr. 137. 1788.
Type: *Swartz*, from Jamaica.

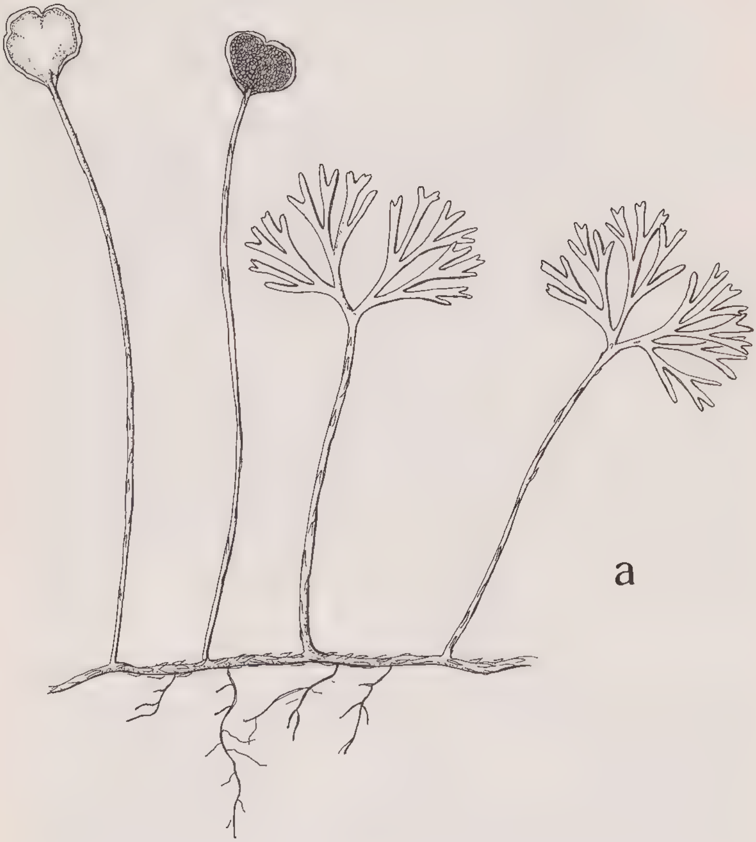

FIGURE 38. **Peltapteris.** a, *P. peltata,* habit showing dichotomously divided, flabellate sterile blades and smaller, obcordate fertile blades, × 0.8.

Syn.: *Acrostichum peltatum* (Sw.) Sw. in J. Bot. Schrader **1800**(2): 11. 1801.
Rhipidopteris peltata (Sw.) Schott ex Fée, Mém. Fam. Foug. **2**: 14. 1845.
Elaphoglossum peltatum (Sw.) Urban, Symb. Antill. **4**: 61. 1903.

Rhizome greenish, filiform and interlacing, forming colonies, with scales lanceolate, thin, pale brown. Sterile fronds 3–15 cm. long; stipes much longer than the blades, sparsely scaly throughout; blades reniform in outline, 2.5–5 cm. broad, 4- to 6-times dichotomously divided; ultimate segments 0.5–1.5 mm. broad. Fertile fronds with longer stipes than the sterile ones; blades 5–20 mm. across, the translucent naked margin erose-dentate.

General Distribution: Greater Antilles, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: On mossy tree trunks and branches, and on mossy logs and rocks especially near streams, at middle and higher elevations.

Doubtful Record

Peltapteris flabellata (Humb. & Bonpl.) Morton was reported from Guadeloupe by Duss (1903) under the name *Rhipidopteris peltata* var. *flabellata*. This was probably a mistaken identification, but I have not seen Duss's specimen.

ELAPHOGLOSSUM Schott ex John Smith

Elaphoglossum Schott ex J. Smith in J. Bot. Hook. 4: 148. 1841.

Figure 39.

Chiefly epiphytic ferns of small to medium size. Rhizomes creeping or rarely erect, bearing scales. Fronds erect or pendent, usually stipitate; stipes nearly always articulate on small projections of the rhizome ("phyllopodia"). Blades simple and entire, dimorphic at least in function, with or without scales, strongly costate, the veins simple or 1- to 3-forked, free or (rarely) casually anastomosing, or sometimes the apices joined by a submarginal vein. Fertile blades often different in size or form from the sterile, the whole abaxial surface covered with sporangia. Sporangia with annulus of about 12 cells; spores ellipsoid, with thick angulate to tuberculate perispore. Gametophytes often bearing large glandular hairs.

Type species: *Elaphoglossum simplex* (Sw.) Schott, based on *Acrostichum simplex* Sw., of Jamaica.

A large pantropical genus of more than 400 species, many of them poorly understood. Most of the names used in older publications are un-

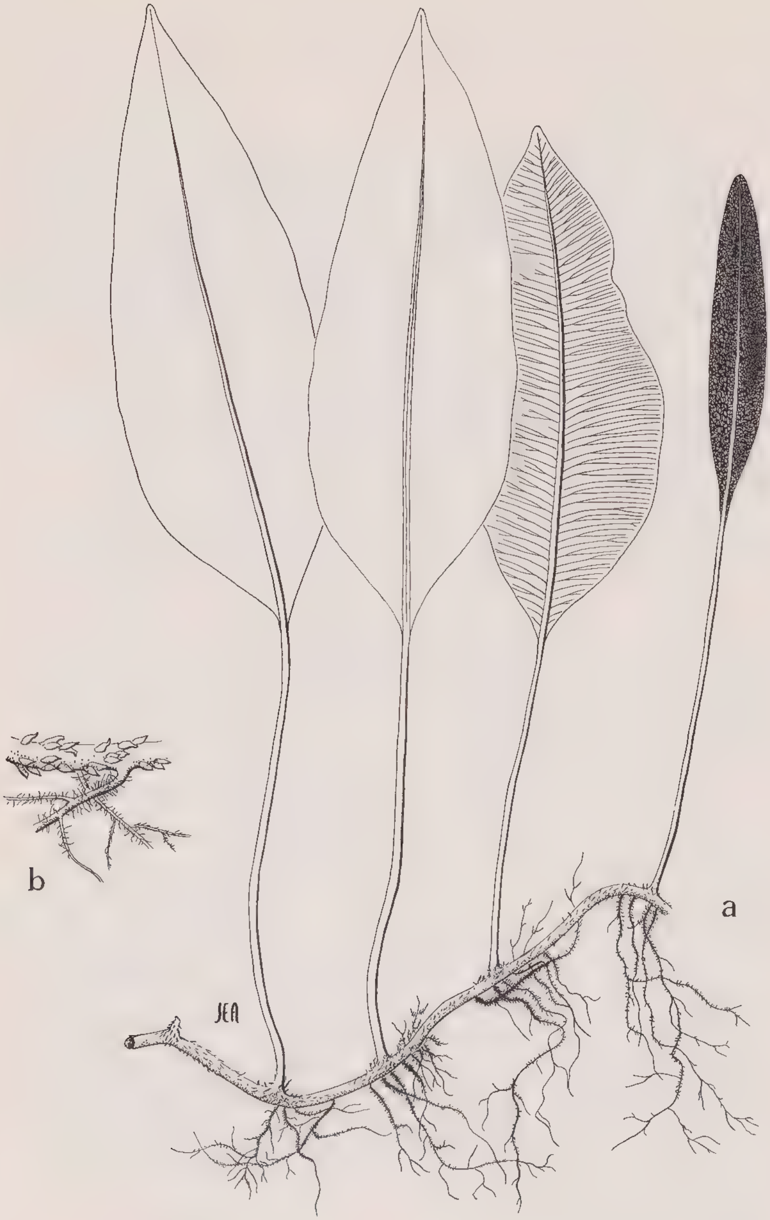

FIGURE 39. **Elaphoglossum.** a, b, *E. scandens*: a, habit, × 0.5; b, rhizome bearing scales, × 1.1.

reliable, owing to the broad and vague species concept applied to this taxon by many authors (particularly Hooker and his colleagues) during the nineteenth century.

Special literature: Christ, Monographie des Genus *Elaphoglossum*, in Neue Denkschr. Schw. Nat. Ges. **36**: 1–159, *79 textf., t. 1–4.* 1899; Morton, Notes on *Elaphoglossum.* II. The species of the French West Indies, in Amer. Fern J. 38: 202–214. 1948.

Key to the Species

- a. Rhizome short- to wide-creeping, not over 3 mm. thick, the fronds usually distant.
  - b. Fronds mostly 2–8 cm. long, with crenulate sterile blades less than 1 cm. broad .... 1. *E. feei*
  - b. Fronds mostly over 15 cm. long, with entire sterile blades.
    - c. Sterile blades linear-attenuate, less than 1.5 cm. broad .... 2. *E. glabellum*
    - c. Sterile blades linear-attenuate, less than 1.5 cm. broad ....
      - d. Rhizome scales brown, nearly glabrous except at extreme base; blades widest below the middle, acute or shortly acuminate at the apex .... 3. *E. scandens*
      - d. Rhizome scales shining black, glandular-ciliate throughout; blades widest at or above the middle, obtuse at the apex .. 4. *E. lingua*
- a. Rhizome short-creeping, often ascending or erect, usually more than 3 mm. thick, the fronds close or clustered.
  - e. Sterile blades naked or apparently so; if scales present, these microscopic, finely dissected, scattered, and not evident to the unaided eye.
    - f. Sterile fronds nearly exstipitate.
      - g. Rhizome scales pale orange-brown, 2 cm. long or more, distantly long-ciliate; fertile fronds exstipitate, less than one-third as long as the sterile ones .... 5. *E. herminieri*
      - g. Rhizome scales dark brown, less than 5 mm. long, glabrous; fertile fronds long-stipitate, more than two-thirds as long as the sterile ones .... 6. *E. rigidum*
    - f. Sterile fronds obviously stipitate.
      - h. Sterile blades linear, 1.5–3 cm. broad, often minutely resinous-dotted beneath .... 7. *E. petiolatum*
      - h. Sterile blades oblong to narrowly elliptic, 3–8 cm. broad, not resinous-dotted beneath.
        - i. Sterile blades long-decurrent below, the wingless portion of the stipe very short (less than 3 cm.); rhachis fibrillose-scaly beneath .... 8. *E. schomburgkii*
        - i. Sterile blades abruptly reduced or short-decurrent below, the wingless portion of the stipe relatively long (often equalling or nearly equalling the blade); rhachis not fibrillose-scaly beneath (if scales present, these minute and rigidly toothed or stellate).
          - j. Vein tips transversely arcuate, usually joined at the apex to form a more or less continuous submarginal venule; rhizome scales deltate-acuminate, glabrous, entire or erose-toothed .... 9. *E. longifolium*

j. Vein tips straight, free, slightly enlarged and translucent (seen by strong transmitted light); rhizome scales linear-attenuate, copiously long-ciliate.

k. Rhizome scales more than 1.5 cm. long, conspicuous; blades acute to acuminate .... 10. *E. impressum*

k. Rhizome scales less than 1 cm. long, not conspicuous; blades blunt or subacute .... 11. *E. martinicense*

e. Sterile blades obviously scaly, at least along the rhachis and margins (older fronds with scales sometimes deciduous, thus leaving them apparently naked).

l. Scales of blade margins essentially flat throughout not much longer than broad, their margins minutely and closely erose to long-ciliate.

m. Stipes clothed with large spreading scales 6–12 mm. long; margins of sterile blades each with two closely overlapping rows of conspicuous, rounded-cordate scales .... 12. *E. decoratum*

m. Stipes bearing smaller scales (less than 2 mm. long); margins of sterile blades with small scales not different from those of the blade surfaces.

n. Scales on underside of sterile blades pale reddish, coarsely long-ciliate, densely covering the surface .... 13. *E. perelegans*

n. Scales on underside of sterile blades whitish, minutely short-ciliate, scattered, leaving much of the tissue surface exposed .... 14. *E. boryanum*

l. Scales of blade margins subulate-attenuate or hairlike, bullate or inflated at base, with entire to distantly denticulate margins.

o. Sterile blades (or some of them) emarginate and proliferous at the apex .... 15. *E. hirtum*

o. Sterile blades neither emarginate nor proliferous.

p. Vein tips clearly enlarged, terminating in the tissue and not reaching the margins; rhizome scales not conspicuous, less than 8 mm. long.

q. Fronds nearly exstipitate, the blades long-attenuate below, the very short stipes nearly naked, their few small scales not hairlike .... 16. *E. brachyneuron*

q. Fronds distinctly stipitate, the blades short-decurrent; stipes conspicuously clothed with numerous spreading hairlike scales.

r. Fertile blades oval to orbicular, without scales among the sporangia; sterile blades blunt or rounded at the apex .... 17. *E. spatulatum*

r. Fertile blades oblong, with hairlike scales among the sporangia; sterile blades narrowed and more or less acuminate at the apex.

s. Sterile blades 4–12 cm. long, freely clothed throughout on both sides with numerous bristly hairlike scales; tissue bearing scattered minute stipitate glands; stipes not over 7 cm. long .. 18. *E. plumieri*

s. Sterile blades to 20 cm. long, very sparsely clothed (chiefly beneath) with a few hairlike scales; tissue lacking stipitate glands; stipes to 20 cm. long .... 19. *E. smithii*

p. Vein tips enlarged or not, terminating at the margins; rhizome scales conspicuous, usually 10–20 mm. long.
  t. Fronds nearly exstipitate, the blades long-attenuate below; scales along underside of the costa 1–2 mm. long . . . . 20. *E. apodum*
  t. Fronds long-stipitate (stipes sometimes to 25 cm. long), the blades short-decurrent; scales along underside of the costa 3–5 mm. long . . . . 21. *E. erinaceum*

1. **Elaphoglossum feei** (Bory ex Fée) T. Moore, Ind. Fil. xvi. 1857.

Basionym: *Acrostichum feei* Bory ex Fée, Mém. Fam. Foug. 2: 48, *t. 18, fig. 2.* 1845.
Type: *de Thiouville in 1844*, from near Bains Chauds de Matouba, Guadeloupe.

Rhizome elongate, slender, 0.6–1 mm. thick, loosely clothed with light brown, lance-attenuate scales mostly 2–3 mm. long, these deeply cordate at the point of attachment and sometimes glandular at the tip. Fronds distant, of firm texture, nearly opaque; stipes slender, bearing a few spreading scales like those of the rhizome. Sterile fronds numerous, with green-winged stipes shorter than the blades; blades lance-linear to lanceolate or narrowly ovate, mostly 3–8 mm. broad (rarely more), blunt at apex, long-decurrent below, glabrous and naked, the veins concealed, simple or 1-forked, with enlarged tips not reaching the margins. Fertile fronds with nonwinged stipes much longer than the blades; blades oblong to ovate-oblong, 9–20 mm. long, 3–5 mm. broad, blunt or acute at the apex, short-decurrent.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: On mossy tree trunks in moist montane forest at middle to higher elevations.

2. **Elaphoglossum glabellum** J. Smith in London J. Bot. 1: 197. 1842.

Type: *Schomburgk 447*, from British Guiana (now Guyana).
Syn.: *Acrostichum martinicense* sensu Fée, Mém. Fam. Foug. 2: 45, *t. 16, fig. 3.* 1845, not Desvaux, 1811.
  Acrostichum glabellum (J. Smith) Klotzsch in Linnaea 20: 421. 1847.
  Acrostichum simplex sensu Griseb., Fl. Br. W. Ind. 676. 1864, not Sw., 1788.
  Acrostichum simplex var. *martinicense* (Fée) Jenman in Bull. Bot. Dept. Jamaica II, 5: 22. 1898; Ferns Br. W. Ind. & Guiana 331. 1909, excl. ref. Desvaux.
  Elaphoglossum simplex var. *martinicense* (Fée) Urban, Symb. Antill. 4: 60. 1903.

Rhizome short- to wide-creeping, 1.5–2 mm. thick, deciduously scaly at the apex, the scales rigid, deltate-attenuate, ca. 2 mm. long, shining blackish with light brown margins, sparsely ciliate with a few pluricellular gland-tipped hairs. Sterile fronds numerous, distichous, mostly 5–10 mm. apart (sometimes closer), rigid, 18–35 cm. long; stipes relatively short, narrow-winged and naked; blades linear-attenuate, mostly 15–30 cm. long, 0.5–1.5 cm. broad, long-attenuate at both ends, the margins often revolute; tissue thick-coriaceous, opaque, bluish-green, and very obscurely punctate-scaly on both sides, the minute scales stellate, the veins concealed, mostly 1-forked, reaching the cartilaginous margins. Fertile fronds half or two-thirds as long as the sterile ones, but with longer stipes; blades linear or elliptic-linear, 8–12 cm. long, 0.5–1.1 cm. broad, abruptly acute at the apex and cuneate at the base.

GENERAL DISTRIBUTION: Greater Antilles, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique.

HABITAT: Epiphytic in mountain forests at middle elevations.

3. **Elaphoglossum scandens** T. Moore, Ind. Fil. 14. 1857.

Lectotype: *de Thiouville in 1844*, from Matouba, Guadeloupe (P).
Syn.: *Acrostichum scandens* Bory ex Fée, Mém. Fam. Foug. 2: 33. 1845, not Raddi, 1819.
Acrostichum lingua var. *scandens* (T. Moore) Krug in Engl. Bot. Jahrb. 24: 138. 1897.

Rhizome elongate, 1.5–2.5 mm. thick, clothed especially toward the apex with thin, glistening brown, lance-attenuate scales 2–4 mm. long, these peltately attached and long-ciliate especially near the base with long, pluricellular, gland-tipped hairs. Sterile fronds widely-spaced (2–3 cm. apart), stiff, mostly 15–28 cm. long, long-stipitate; stipes as long as the blades or a little shorter, naked or nearly so; blades narrowly ovate, 9–16 cm. long, 3.5–5.5 cm. broad below the middle, acute to short-acuminate at apex, abruptly short-decurrent at base; tissue coriaceous, semi-opaque, very minutely punctate-scaly throughout on both sides, the scattered scales blackish, stellate, the veins close, simple or 1-forked, reaching the cartilaginous margin. Fertile fronds nearly equalling the sterile ones; blades lance-linear or narrowly lance-oblong, 8–10 cm. long, 1.4–1.7 cm. broad, blunt at apex, short-decurrent at base.

GENERAL DISTRIBUTION: South America (?).

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique.

HABITAT: Epiphytic in moist forests at middle to higher elevations.

4. **Elaphoglossum lingua** Brack. in Wilkes, Expl. Exp. 16: 74. 1854.

Type: *Raddi*, from Brazil.
Syn.: *Acrostichum lingua* Raddi in Opus. Sci. Bol. 3: 283. 1819; Pl. Bras. Fil. 5, *t. 15*, *fig. 4*. 1825, not Thunb., 1784.

Rhizome elongate, 2–3 mm. thick, deciduously clothed toward apex with rigid, shining black, deltate-acuminate scales 1.2–2 mm. long, these peltately attached near the base and long-ciliate throughout with long, pluricellular, gland-tipped hairs. Fronds 0.5–1.5 cm. apart, stiff and coriaceous. Sterile fronds mostly 20–35 cm. long, long-stipitate; stipes distinctly shorter than the blades, naked or nearly so; blades oblong-elliptic to narrowly obovate, 15–22 cm. long, 4.5–6 cm. broad at or above the middle, rounded at the apex, short-decurrent at base; tissue semiopaque, very minutely punctate-scaly throughout on both sides, the scattered scales brown, stellate-glandular, the veins close, simple or 1-forked, with enlarged tips reaching the cartilaginous margins. Fertile fronds mostly longer than the sterile ones; blades narrowly oblong, 13–14.5 cm. long, 2–2.7 cm. broad, obtuse and short-decurrent.

General Distribution: Trinidad, South America.

Distribution in Lesser Antilles: Grenada.

Habitat: On mossy tree trunks at middle elevations.

5. **Elaphoglossum herminieri** (Bory & Fée) T. Moore, Ind. Fil. xvi. 1857.

Basionym: *Acrostichum herminieri* Bory & Fée in Fée, Mém. Fam. Foug. 2: 43, *t. 11.* 1845.
Type: *L'Herminier*, from Guadeloupe.

Rhizome decumbent to erect, stout, 1–2 cm. thick (excluding scales), densely clothed with loosely matted, orange-brown, linear or filiform scales 2–4.5 cm. long, these laxly tortuous and distantly ciliate. Sterile fronds closely distichous or clustered, pendent; blades narrowly to broadly linear, 30–95 cm. long, 1.5–4 cm. broad near the middle, attenuate at both ends (the apex sharply acute); tissue thick, coriaceous, opaque, lustrous blue-green on upper side, very minutely punctate-scaly on both sides, the scattered scales pale brown and stellate, the veins immersed, mostly 2- to 3-forked, with scarcely enlarged tips reaching the cartilaginous margins. Fertile fronds infrequently produced; blades broadly oblanceolate to pointed-oblong, 10–18 cm. long, 1.5–5 cm. broad.

General Distribution: Greater Antilles, Central and South America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On trunks of forest trees at lower to middle elevations; plants not common.

6. **Elaphoglossum rigidum** (Aubl.) Urban, Symb. Antill. 9: 374. 1925.

Basionym: *Polypodium rigidum* Aubl., Hist. Pl. Guian. 2: 963. 1775.
Type: *Aublet*, from French Guiana. Aublet also cited Plumier, Tr. Foug. *t. 135*, which illustrates a plant from Martinique that is probably

not this species, although it would seem that the inappropriate epithet *rigidum* was taken from the Plumier polynomial.

Syn.: *Acrostichum flaccidum* Fée, Mém. Fam. Foug. **2**: 35, *t. 7, f. 2.* 1845. (Type from Guadeloupe.)
Elaphoglossum flaccidum (Fée) T. Moore, Ind. Fil. 356. 1862.

Rhizome short-creeping or ascending, woody, 3–5 mm. thick, clothed with dark brown, deltate- to lance-attenuate scales 2–3 mm. long, these peltately attached near the base, glandular-filiform at the apex, with margins obscurely toothed and with a few pluricellular gland-tipped hairs. Sterile fronds close or subfasciculate, erect, 15–45 cm. long; blades lanceolate or lance-linear, 2–4 cm. broad near the middle, evenly narrowed to both ends (the apex long-acuminate); tissue thin-herbaceous, translucent, very minutely punctate-scaly on both sides, the remotely scattered scales stellate, few-celled, the veins evident, simple or 1-forked (mostly near the base), with slightly enlarged tips almost reaching the cartilaginous margins. Fertile fronds shorter than the sterile ones; blades lance-linear, 8–18 cm. long, 1–2.5 cm. broad.

GENERAL DISTRIBUTION: Greater Antilles except Jamaica; Trinidad, South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique.

HABITAT: Epiphytic in mountain forests at middle or higher elevations; plants rare.

7. **Elaphoglossum petiolatum** (Sw.) Urban, Symb. Antill. **4**: 61. 1903. var. **dussii** (L. M. Underw. ex Maxon) Proctor in Rhodora **68**: 467. 1966.

Basionym: *Elaphoglossum dussii* L. M. Underw. ex Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 398. 1926.
Type: *Duss 4688*, from Martinique (NY).
Syn.: *Acrostichum plumieri* Desvaux in Mém. Soc. Linn. Paris **6**: 209. 1827, not *Elaphoglossum plumieri* T. Moore, 1857. (Type from Martinique.)
Acrostichum viscosum sensu Griseb., Fl. Br. W. Ind. 676. 1864, in part, with regard to refs. Dominica and St. Vincent, not Sw., 1806.
Elaphoglossum petiolatum sensu Domin, Pter. Dominica 104. 1929, in part, not *Acrostichum petiolatum* Sw., 1788.

Rhizome short-creeping, 2–6 cm. long, 5–8 mm. thick (excluding scales), densely scaly, the bright brown, narrowly lance-attenuate scales 3–6 mm. long, flexuous toward the delicate hair-pointed apex, with distantly ciliate margins. Sterile fronds numerous, closely distichous, ascending or spreading, 20–65 cm. long; stipes slender, half as long as the blades or less, bearing a few dark substellate scales; blades linear, 18–45 cm. long, 1.5–3 cm. broad, attenuate at both ends but not decurrent; tissue papery-herbaceous to coriaceous, semi-translucent, minutely and deciduously scaly on both sides, the scales of the upper side whitish, roundish, and fimbriate, those of the underside darker, remote, and stellate, the veins mostly 1-forked, with enlarged tips not reaching the slightly cartilaginous, revolute margins. Fertile fronds few, seasonal, often equalling the sterile ones, long-stipitate; blades narrowly linear, 12–35 cm. long, 0.4–0.7 cm. broad.

General Distribution: Hispaniola, Puerto Rico, South America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: Mossy logs and larger branches of forest trees at middle and higher elevations; plants common.

This species is distinguished from typical *Elaphoglossum petiolatum* of the Greater Antilles (especially Jamaica) chiefly by having much more naked and less resinous-glandular frond tissue and somewhat different rhizome scales.

8. **Elaphoglossum schomburgkii** (Fée) T. Moore, Ind. Fil. 14. 1857.

Basionym: *Acrostichum schomburgkii* Fée, Mém. Fam. Foug. 2: 32, *t. 8, fig. 2.* 1845.
Type: *Schomburgk 450*, from British Guiana (now Guyana) (P, isotype).

Rhizome short-creeping to ascending, woody, 4–10 mm. thick, clothed at apex with delicate pale brown, narrowly deltate-attenuate scales 3–5 mm. long, each with a contorted-denticulate, filiform apex and distantly glandular-ciliate margins. Sterile fronds closely distichous or apparently clustered, erect, 40–65 cm. long; stipes stout (1.5–3 mm. thick), densely clothed toward the base with thin, pale brown, lanceolate scales to 8 mm. long, each with a contorted-filiform apex and long-ciliate margins; blades oblanceolate to narrowly elliptic, 38–60 cm. long, 5–8.5 cm. broad near or above the middle, acute to short-acuminate (or rarely blunt) at the apex; tissue stiffly papery-herbaceous, semitranslucent, naked above, minutely punctate-scaly beneath, the scales filiform-contorted from a stellate base, the veins simple, or 1-forked especially near the base of the blade, with tips abruptly enlarged against the cartilaginous margins. Fertile fronds shorter than the sterile ones but with longer stipes; blades narrowly oblong to oblanceolate, 15–35 cm. long, 2.5–3 cm. broad, shortly acute at apex and decurrent at base.

General Distribution: Northern South America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat.

Habitat: Shaded mossy ledges, stumps and trees at middle to higher elevations.

The Lesser Antilles material exactly matches *Maguire 24516* from Surinam, determined as this species by Maxon and Morton, and appears to be conspecific with type material at Paris. Other specimens from northern

South America vary in one or more characters, as does Fée's original illustration.

9. **Elaphoglossum longifolium** J. Smith in Comp. Curt. Bot. Mag. 72: 17. 1846.

Type: *Jacquin*, from Martinique, not seen and perhaps no longer extant. With his original description, Jacquin cited Plumier, Tr. Foug. *t. 135*, which illustrates a plant from Martinique, but this is not a very good match for the species as it is now understood; in particular, the fertile frond shown is much too short. For this reason I am reluctant to cite the Plumier plate as lectotype.

Syn.: *Acrostichum longifolium* Jacq., Coll. Bot. 2: 105. 1788, not Burm., 1768.
Olfersia longifolia C. Presl, Tent. Pter. 234. 1836.
Aconiopteris longifolia Fée, Mém. Fam. Foug. 2: 80, *t. 41*. 1845.
Acrostichum latifolium sensu Griseb., Fl. Br. W. Ind. 677. 1864, in part, not Swartz, 1788.

Rhizome short-creeping or ascending, woody, 6–12 mm. thick, densely clothed at apex with firm, dark brown, deltate to ovate-lanceolate scales 6–11 mm. long, these acuminate, glabrous, and with entire or erosely toothed margins. Sterile fronds very closely distichous, erect, 35–85 cm. long, with grooved, nearly naked or sparsely scaly stipes 8–16 cm. long; blades lanceolate-ligulate, 30–70 cm. long, 4–9 cm. broad, acuminate at the apex, abruptly short-decurrent at base; rhachis naked or nearly so; tissue rigidly thin-herbaceous, semitranslucent, naked above, very minutely punctate-scaly beneath, the scales stellate, the veins evident, mostly 1- to 2-forked, rarely a few anastomosing in the tissue, mostly joined near the margin. Fertile fronds few, shorter than the sterile ones, 35–65 cm. long with stipes to 35 cm. long; blades lance-linear, 15–50 cm. long, 1.5–4 cm. broad.

GENERAL DISTRIBUTION: Greater Antilles except Jamaica; continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Lucia, Grenada.

HABITAT: Epiphytic in mountain forests at middle to higher elevations.

This species belongs to a complex of closely related forms whose relationships are not well known. As a result, specimens of all forms are frequently misidentified as *E. longifolium* and published reports of the latter cannot be relied upon.

10. **Elaphoglossum impressum** (Fée) T. Moore, Ind. Fil. 10. 1857.

Basionym: *Acrostichum impressum* Fée, Mém. Fam. Foug. 2: 33, *t. 5, fig. 3.* 1845.
Type: *L. C. Richard, Herb. Richard*, from Martinique (P).
Syn.: *Acrostichum latifolium* var. *alismifolium* sensu Duss, Foug. & Lyc. Antill. Franc. 27. 1903, not *A. alismifolium* Fée, 1845.

Elaphoglossum alismifolium sensu Morton in Amer. Fern J. 38: 211. 1948, not T. Moore, 1857.

Acrostichum alismifolium Fée has been placed in the synonymy of the Brazilian species *Elaphoglossum brevipes* (Kunze) T. Moore by Alston in Bol. Soc. Broter. Ser. II, 32: 11. 1958. Although Fée in his original publication (Mém. Fam. Foug. 2: 28, *t. 3.* 1845) gave Guadeloupe as a locality (and Morton in 1948 cited *L'Herminier* from Guadeloupe as the type), only South American material was cited under "Exsiccata." Alston evidently considered the Lesser Antillean *E. impressum* to be taxonomically distinct from *E. alismifolium* (= *E. brevipes*), and although I have not been able to study the same materials, I have decided to follow Alston in the present treatment.

Rhizome short-creeping, woody, 5–7 mm. thick (excluding scales), the scales abundant, conspicuous especially at apex of the rhizome, lax, pale orange-brown, linear-attenuate, mostly 15–20 mm. long, sparingly glandular-ciliate (the cilia long, delicate, and pluricellular). Sterile fronds close or subfasciculate, 15–48 cm. long, long stipitate; stipes shorter than to nearly equalling the blades, sparingly clothed with small or minute, dark purple-brown, denticulate-glandular scales, these deciduous and leaving resinous dots at former points of attachment; blades ligulate-lanceolate, 10–28 cm. long, 3.5–6 cm. broad near or below the middle, short-acuminate at the apex, cuneate and short-decurrent at base, rhachis with a few denticulate scales beneath like those of the stipe; tissue papery to stiff-coriaceous, subtranslucent, naked above, very minutely punctate-scaly beneath, the remote scales brown, stellate, the veins simple or 1-forked, with enlarged tips reaching the margins. Fertile fronds shorter to longer than the sterile ones; blades linear-oblong, 15–23 cm. long, 2–3.5 cm. broad.

General Distribution: Endemic to the Lesser Antilles (?).

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, Grenada.

Habitat: On mossy stumps and tree trunks at middle to higher elevations.

The relationship between the Lesser Antilles population and related continental forms needs clarification.

11. **Elaphoglossum martinicense** (Desvaux) T. Moore, Ind. Fil. 11. 1857.

Basionym: *Acrostichum martinicense* Desvaux in Ges. Naturf. Freunde Berlin Mag. 5: 309. 1811.

Type: Without specified collector, ex *Herb. Desvaux*, collected in Martinique (P).

Syn.: *Acrostichum simplex* sensu Griseb., Fl. Br. W. Ind. 676. 1864, in part, not Swartz, 1788.

Acrostichum simplex [var.] *"A" martinicense* (Desvaux) Jenman, Ferns Br. W. Ind. & Guiana 331. 1909, with regard to name.

Elaphoglossum underwoodianum Maxon in Sci. Surv. Porto Rico & Virgin Is. 6: 397. 1926. (Type from Puerto Rico.)

Rhizome creeping, subflexuous, woody, 3–5 mm. thick (excluding scales), the thin scales laxly spreading, lightly rusty brown, lance-linear, 5–8 mm. long, each with a long-attenuate apex, a subcordate base, and fibrillose-ciliate margins. Sterile fronds erect, close (or to 1 cm. apart), mostly 20–55 cm. long; stipes about equalling the blades, nearly naked; blades elliptic-oblong, mostly 10–25 cm. long, 3–6 cm. broad, abruptly acute and short-decurrent at base; tissue rigid, nearly opaque, obscurely punctate-scaly beneath, the minute scales remote, few-celled, the veins immersed, close, mostly 1-forked, with slightly enlarged tips reaching the margins. Fertile fronds about equalling the sterile ones (with longer stipes); blades linear or oblong-linear, 7–20 cm. long, 1.3–2.5 cm. broad, acuminate at the apex, acute at base.

General Distribution: Hispaniola, Puerto Rico.

Distribution in Lesser Antilles: Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On tree trunks and mossy stumps at middle to higher elevations.

12. **Elaphoglossum decoratum** (Kunze) T. Moore, Ind. Fil. 8. 1857.

Basionym: *Acrostichum decoratum* Kunze in Linnaea 9: 25. 1835; Anal. Pter. 9, *t. 6.* 1837.
Type: *Poeppig, Diar. 1134*, from Pampayaco, Peru.

Rhizome ascending or erect, stout, 1–2 cm. thick (excluding scales), densely scaly, the scales thin, light brown, filiform to lance-linear, 15–25 mm. long, laxly undulate-crispate, glabrous. Sterile fronds clustered, erect, 30–90 cm. long; stipes stout, ventrally grooved, densely covered with large, thin, yellowish-brown, ovate-cordate scales; blades elliptic-oblong, 20–55 cm. long, 6–13 cm. broad, abruptly short-acuminate at the apex, roundish to acute at base; rhachis scaly like the stipe (but the scales smaller); tissue dark green, thick, coriaceous, the underside very minutely and distantly stellate-scaly, the veins immersed but evident, mostly 1-forked near the base, casually joined at the thickened tips along the margin. Fertile fronds rare, shorter than the sterile ones; blades lance-oblong, 12–32 cm. long, 3.5–6 cm. broad, the margins lacking imbricate scales.

General Distribution: Greater Antilles except Cuba; Central and South America.

Distribution in Lesser Antilles: Guadeloupe, *Mazé 779* (IJ, K).

Habitat: Tree trunks and at the bases of trees in wet forested ravines at middle elevations; this species very rare throughout its range.

13. Elaphoglossum perelegans (Fée) T. Moore, Ind. Fil. xvi. 1857.

Basionym: *Acrostichum perelegans* Fée, Mém. Fam. Foug. 2: 55, *t. 23.* 1845.

Syntypes: *Vauthier in 1833, "Herb. Bory,"* from Sabera, Brazil; *Pohl in 1844*, from Goyaz; and *Poeppig in 1829*, from Pampayaco, Peru. Fée also cited (with some doubt) Plumier, Tr. Foug. *t. 139*, representing a plant from either Martinique or Hispaniola.

Syn.: *Acrostichum muscosum* sensu Griseb., Fl. Br. W. Ind. 676. 1864, in part, with regard to ref. Dominica, not Sw., 1788.

Acrostichum cuspidatum sensu Krug in Engl. Bot. Jahrb. 24: 141. 1898, not Willd. in L., 1810.

Elaphoglossum cuspidatum sensu Domin, Pter. Dominica 103. 1929, not (Willd.) T. Moore, 1857.

Elaphoglossum vestitum sensu Morton in Amer. Fern J. 38: 207. 1948, not *E. vestitum* (Schlecht. & Cham.) Schott, 1834.

The taxonomy of the plants related to *Elaphoglossum vestitum* is very complex and confused, as shown by the synonymy given above. In the original draft manuscript of this book, I accepted Morton's assignment of the Lesser Antilles population to *E. vestitum*, but since then have had second thoughts. The Lesser Antilles plants are at least varietally distinct from typical Mexican *E. vestitum* in having the sterile blades a different shape (proportion of width to length and abruptly narrowed instead of long-attenuate at base), and in having essentially glabrous or remotely denticulate rhizome scales instead of long-ciliate ones (this distinction does not apply to scales located around the bases of stipes). Although these differences are not very great, they seem to ally the Lesser Antillean plants with South American forms best typified by *E. perelegans*, and it seems desirable to allow the specific epithet applied to our population to reflect this relationship.

Rhizome short-creeping, decumbent or ascending, 3–5 mm. thick, densely tufted-scaly at the apex, the scales stiff, deep lustrous mahogany-brown, deltate- to lance-attenuate, mostly 2–5 mm. long, each with a hairlike apex and subentire or remotely denticulate margins. Sterile fronds close or subfasciculate, mostly 15–35 cm. long, long-stipitate; stipes shorter than or nearly equalling the blades, densely but deciduously clothed with loose, thin, pale brown long-ciliate scales; blades oblong-ligulate or narrowly elliptic, 9–23 cm. long, 2–3.5 cm. broad at the middle, abruptly caudate-acuminate at the apex, short-cuneate at base; tissue thin-herbaceous to papery, subtranslucent, clothed on upper side with whitish, appressed, ciliate scales (these deciduous with age), beneath more densely scaly with pale reddish-brown, loose, subpersistent, long-ciliate scales, the veins simple or 1-forked, with enlarged tips almost reaching the margins. Fertile fronds equalling or longer than the sterile ones; blades to 20 cm. long or more, 0.8–1 cm. broad, acute at apex, attenuate at base.

General Distribution: South America, especially Brazil.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: Mossy trunks of trees (especially tree-ferns) at chiefly higher elevations.

14. **Elaphoglossum boryanum** (Fée) T. Moore, Ind. Fil. 7. 1857.

Basionym: *Acrostichum boryanum* Fée, Mém. Fam. Foug. **2:** 40, *t. 1.* 1845.
Syntypes: *L'Herminier*, from Guadeloupe, and *Guiraux ex Bory*, from Martinique.
Syn.: *Elaphoglossum lloydii* L. M. Underw. ex Domin, Pter. Dominica 106, *t. 20, fig. 2.* 1929.

Rhizome erect, woody, 8–11 mm. thick, bearing a tuft of scales at the apex, the scales glossy yellow-brown, narrowly lance-attenuate, mostly 5–11 mm. long, glabrous and entire, with filiform apex, the cells throughout being very narrow and elongate. Sterile fronds clustered, erect or spreading, 22–60 cm. long, long-stipitate; stipes much shorter than the blades, densely clothed with thin, flat, pale brown, laxly spreading lanceolate scales having minutely erose-denticulate margins; blades lanceolate or lance-ligulate, 17–46 cm. long, 5–8 cm. broad below the middle, sharply acuminate at the apex, abruptly acute at base; tissue firmly herbaceous, translucent, clothed on both sides (but especially beneath) with numerous scattered, flat, thin, whitish or pale brown ovate or ovate-lanceolate scales, these peltately attached and having minutely erose-ciliate margins, the veins simple or 1-forked, sometimes casually anastomosing, with much enlarged tips not reaching the margins. Fertile fronds mostly equalling the sterile ones or a little longer, but with much longer stipes; blades lance-linear to lanceolate, 9–21 cm. long, 1.8–2.8 cm. broad, blunt or somewhat acute at both ends.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique.

HABITAT: On mossy rocks, logs, and tree trunks at chiefly middle elevations; plants locally frequent.

15. **Elaphoglossum hirtum** (Sw.) C. Chr., Ind. Fil. 308. 1905.

Basionym: *Acrostichum hirtum* Sw., J. Bot. Schrader **1800**(2): 10. 1801.
Type: *Herb. Thunberg 24408*, from an unknown locality (UPS) (as reported by Pichi-Sermolli and Schelpe in Webbia **23:** 149–151, *1 fig.* 1968). The name *Elaphoglossum hirtum* has previously been applied to species occurring in Jamaica and elsewhere.
Syn.: *Acrostichum undulatum* Willd. in L., Sp. Pl. **5:** 105. 1810. (Type from Martinique, Plumier, Tr. Foug. *t. 126.*)
Acrostichum podotrichum Desvaux in Ges. Naturf. Freunde Berlin Mag. **5:** 309. 1811. (Type from "Carib. Is.")
Olfersia undulata (Willd.) C. Presl, Tent. Pter. 234. 1836.
Elaphoglossum undulatum (Willd.) T. Moore, Ind. Fil. 16. 1857.

Rhizome ascending or suberect, woody, 6–8 mm. thick, bearing a tuft of scales at the apex, the scales glossy yellow- to red-brown, narrowly lance-attenuate, mostly 4–6 mm. long, minutely denticulate, each with a contorted subfiliform apex, the cells of scales not as narrow as those of

E. boryanum. Sterile fronds clustered, suberect or spreading, mostly 15–42 cm. long, short- to long-stipitate; stipes of Lesser Antilles plants much shorter than the blades, densely clothed with spreading, brown, bullate-based, attenuate-pointed scales 2–3 mm. long, these denticulate toward the apex; blades lanceolate to oblong, 11–26 cm. long, 2.6–7.5 cm. broad, often retuse-proliferous at the apex but sometimes acuminate and not proliferous, acute to truncate at base; tissue firmly herbaceous, translucent, clothed on both sides with scattered brown scales like those of the stipe but smaller and hair-pointed, the veins widely spaced, simple or 1-forked, with tips much enlarged, terminating in the tissue 1–1.5 mm. from the margins. Fertile fronds shorter than or equalling the sterile ones, but with much longer stipes; blades lanceolate or narrowly oblong, 4.5–14 cm. long, 1–2.5 cm. broad, bearing numerous lance-attenuate scales among the sporangia.

General Distribution: Trinidad (see discussion below); a form similar to the one from Trinidad (perhaps conspecific) has recently been found in Costa Rica.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe (reported by Duss), Dominica (reported by Urban), Martinique, Grenada.

Habitat: In shaded humus and on mossy tree trunks in mountain forests at chiefly higher elevations.

The Trinidad population, though undoubtedly conspecific, differs in having darker rhizome scales, very much longer stipes, and flatter (instead of bullate or inrolled), broader scales of the sterile fronds; it should probably be treated as a geographic variety. Most reports of this species from other countries are probably based on misidentifications.

16. **Elaphoglossum brachyneuron** (Fée) J. Smith, Cat. Cult. Ferns 26. 1857.

Basionym: *Acrostichum brachyneuron* Fée, Mém. Fam. Foug. 2: 49, *t. 22, fig. 1.* 1845.

Type: *Gardner 5928* (as cited by Fée), "in *Herb. Webb.*" from Minas Gerais, Brazil. Alston (1958) says that this number at the British Museum is a different species, and instead cites *Gardner 5927*; it is possible that Fée's citation was a misprint.

Syn.: There is an extensive South American synonymy of this species, not relevant to the present work.

Rhizome ascending, woody, 3–4 mm. thick, densely scaly throughout, the red-brown scales narrowly deltate-attenuate or lance-attenuate, mostly 2–5 mm. long, entire, and glabrous. Sterile fronds close or subfasciculate, erect, mostly 25–43 cm. long; stipes very short, not more than 1–1.5 cm. long; blades narrowly linear-oblanceolate, 1–2 cm. broad above the middle, gradually narrowed and acuminate at the apex, long-attenuate and decurrent at base; rhachis deciduously scaly beneath toward the base, the scattered scales like those of the rhizome; margins irregularly crenulate and slightly undulate, bearing a small deciduous, red-brown, spreading subulate scale at each marginal notch; tissue thin-herbaceous, translucent, very minutely punctate-scaly on both sides, the remote scales brown and stellate, the veins widely spaced, simple or 1-forked, with much enlarged, punctate tips terminating 0.5–1 mm. from the margins. Fertile fronds shorter than the sterile ones, similar in outline.

General Distribution: Hispaniola, South America.

Distribution in Lesser Antilles: Guadeloupe, *Proctor 20315* (A, IJ); also two Duss collections were cited by Christ (1899).

Habitat: On mossy tree trunks in montane woodland at high elevations; plants very rare.

17. Elaphoglossum spatulatum (Bory) T. Moore, Ind. Fil. 14. 1857.

Basionym: *Acrostichum spatulatum* Bory, Voy. Mers. Afr. 1: 363, *t. 20, fig. 1.* 1804. Subsequent authors have usually spelled this name "*spathulatum*," but there seems to be no justification in altering Bory's original orthography.

Type: *Bory*, from Reunion. If Bory's specimen cannot be located, his excellent plate can serve as lectotype.

Syn.: *Acrostichum piloselloides* C. Presl, Rel. Haenk. 1: 14, *t. 2, fig. 1.* 1825. (Type from Peru.)
Acrostichum pilosella Sprengel in L., Syst. Veg. 4: 34. 1827.
Elaphoglossum piloselloides (C. Presl) T. Moore, Ind. Fil. 13. 1857.
Acrostichum pusillum Mettenius ex Kuhn in Linnaea 36: 43. 1869. (Type from Cuba.)
Elaphoglossum pusillum (Mettenius ex Kuhn) C. Chr., Ind. Fil. 314. 1905.

Many other synonyms, especially for South American forms, apparently exist; the group as a whole contains several variant populations and requires monographic revision.

Rhizome erect or ascending, 2–4 mm. thick, densely scaly, the tufted scales erect, light brown, subulate-acicular, 3–5 mm. long, with denticulate margins. Sterile fronds numerous, tufted, ascending or spreading, clothed with scattered pale- or yellowish-brown setiform scales (each from a bullate base); blades oblong or elliptic, 1.5–5 cm. long, 0.5–1.5 cm. broad, obtuse at the apex, acute to long-cuneate at base; tissue herbaceous, light green, more or less translucent, freely clothed throughout with persistent hairlike scales, the veins widely spaced, simple or 1-forked, with enlarged tips terminating ca. 0.5 mm. from the margins. Fertile fronds often several, 3–7 cm. long, long-stipitate; blades roundish to oblong-ovate, 1–2 cm. long, 0.7–1.5 cm. broad, somewhat acute or retuse.

General Distribution: Apparently pantropical, as here defined; monographic study may reveal valid local segregates.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: On mossy trees, banks and cliffs at middle to high elevations; plants rare.

18. Elaphoglossum plumieri T. Moore, Ind. Fil. 13. 1857.

Lectotype: Plumier, Tr. Foug. *t. 127*, allegedly based on material from "forets humides de l'Islė Saint Domingue" (Hispaniola). When describing *Acrostichum plumieri* (cited below), Fée also reported specimens from Guadeloupe in "*Herb. Bory*, *Mougeat*, etc.". As these specimens have never been relocated, the unequivocal Plumier plate must serve as lectotype. However, the source given for Plumier's plant may have been a mistake, as no one has since found this species outside the Lesser Antilles.

Syn.: *Acrostichum plumieri* Fée, Mém. Fam. Foug. 2: 50. 1845, not Desvaux, 1827.

Acrostichum villosum sensu Griseb., Fl. Br. W. Ind. 675. 1864, in part, with regard to ref. Dominica and "French Islands," not Swartz, 1788.

Rhizome short-creeping to erect, 2–5 mm. thick, scaly at the apex, the tufted, thin, light yellow-brown scales narrowly lance-attenuate, mostly 2–3.5 mm. long, remotely glandular-denticulate. Sterile fronds numerous, tufted, ascending or spreading, mostly 5.5–18 cm. long; stipes slender, much shorter than the blades, densely clothed with spreading, brown, hairlike scales to 3 mm. long; blades narrowly linear-elliptic, mostly 4–15 cm. long, 1–2 cm. broad, bluntly acuminate at apex, narrowed-decurrent at base, the margins shallowly and irregularly sinuate-crenate; tissue thin-herbaceous, translucent, beset with numerous spreading brown hairlike scales, the veins widely spaced, oblique, simple or 1-forked, with enlarged tips terminating 1–1.5 mm. from the margins. Fertile fronds much shorter than the sterile ones, but with longer stipes; blades elliptic, mostly 2–3 cm. long, 0.5–1 cm. broad, blunt at both ends, the fertile side with a pale green nonsporangiate border 1–1.5 mm. broad.

General Distribution: Hispaniola (?).

Distribution in Lesser Antilles: St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

Habitat: On mossy tree trunks at chiefly higher elevations; plants locally frequent.

19. Elaphoglossum smithii (Baker) Christ, Mon. Elaph. 106. 1899.

Basionym: *Acrostichum smithii* Baker in Ann. Bot. 5: 169. 1891.
Type: *H. H. & G. W. Smith 1135*, from St. Vincent (IJ, isotype).

Rhizome decumbent or ascending, 3–6 mm. thick, scaly at the apex, the scales thin, orange-brown, lance-attenuate, 3–6 mm. long, hair-pointed and with margins sharply denticulate to subentire. Sterile fronds loosely clustered, suberect or spreading, mostly 18–37 cm. long; stipes shorter to longer than the blades, slender, lightly and deciduously clothed with spreading, pale brown, hairlike scales to 4 mm. long; blades narrowly linear-elliptic or linear-oblong, mostly 9–20 cm. long, 1.5–2.5 cm. broad, the apex bluntly acuminate, the base narrowed decurrent; tissue herbaceous, translucent, sparsely clothed with small, hairlike scales (chiefly beneath), these early-deciduous, leaving the surfaces naked, the veins widely spaced, simple or 1-forked, with enlarged tips terminating 0.5–1.5 mm. from the slightly wavy-sinuate margins. Fertile fronds much shorter than the sterile, with stipes 12–15 cm. long and lanceolate blades.

General Distribution: Endemic to the Lesser Antilles (but very similar plants from Hispaniola have been named *Elaphoglossum buchii* C. Chr.).

Distribution in Lesser Antilles: St. Vincent, Grenada.

Habitat: On mossy tree trunks at middle to higher elevations; plants very rare.

20. Elaphoglossum apodum (Kaulf.) Schott, Gen. Fil. *under t. 14.* 1834.

Basionym: *Acrostichum apodum* Kaulf., Enum. Fil. 59. 1824.
Type: *Ryan, Herb. Vahl,* from Montserrat (c).
Syn.: *Acrostichum platyneuron* Fée, Mém. Fam. Foug. 2: 43, *t. 4, fig. 1.* 1845, not L., 1753. (Type from Cuba.)
Elaphoglossum platyneuron T. Moore, Ind. Fil. 13. 1857.

Rhizome short, 10–20 mm. thick (excluding scales), densely scaly, the scales tufted, thin, pale glossy orange-brown, linear-attenuate, 6–13 mm. long, tortuous, with irregularly toothed margins. Sterile fronds several, loosely clustered, 20–55 cm. long; stipes nearly absent, or to 3 cm. long, with spreading brown hairlike scales 2–4 mm. long; blades narrowly linear-oblanceolate, 2.5–5 cm. broad above the middle, long-acuminate at the apex, long-attenuate below (but not decurrent); tissue thin-herbaceous, translucent, clothed throughout with spreading brown hairlike scales 1–2 mm. long, the veins evident, distant, with enlarged tips impinging on the slightly thickened margins. Fertile fronds uncommon, similar to the sterile ones but much smaller and narrower.

General Distribution: Greater Antilles, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On mossy tree trunks, rarely on mossy banks or ledges, at middle to higher elevations.

21. **Elaphoglossum erinaceum** (Fée) T. Moore, Ind. Fil. 9. 1857.

Basionym: *Acrostichum erinaceum* Fée, Mém. Fam. Foug. **2:** 41. 1845.
Lectotype: *de Thiouville*, from Rivière de St. Louis, Guadeloupe (P).
Syn.: *Acrostichum hybridum* sensu Hook. & Grev., Ic. Fil. **1:** *t. 21.* 1829, not Bory, 1804.
Elaphoglossum scolopendrifolium sensu Domin, Pter. Dominica 101. 1929, not *E. scolopendrifolium* (Raddi) J. Smith, 1846.

Rhizome decumbent or ascending, 8–15 mm. thick (excluding scales), densely scaly, the scales tufted, lustrous pale orange- or yellow-brown, linear-attenuate, 10–20 mm. long, undulate and often contorted, with margins remotely denticulate. Sterile fronds few, clustered, erect-spreading, mostly 35–82 cm. long; stipes not over half the length of the blades, clothed with numerous spreading, deciduous, blackish-brown, hairlike scales 5–10 mm. long; blades lance-elliptic to linear-oblong, 22–58 cm. long, 4–8 cm. broad, acuminate-cuspidate at the apex, cuneate at base; rhachis scaly beneath like the stipe; tissue firmly papery, translucent, very minutely punctate-scaly beneath, the scales stellate, few-celled, the veins simple or 1-forked, with somewhat enlarged tips impinging on the slightly thickened margins. Fertile fronds 25–45 cm. long; stipes usually much longer than the blades; blades 10–17 cm. long, 2–3.5 cm. broad, similar in shape to the sterile one but with fewer scales.

General Distribution: Greater Antilles, continental tropical America from Mexico to South America; apparently replaced in the region of Bolivia and Brazil by the closely related *Elaphoglossum scolopendrifolium*, the ranges of the two partly overlapping.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: On trunks of large trees in primary rain forest at chiefly middle elevations; plants rare.

Doubtful Records

In his paper on the species of the French West Indies (1948), Morton listed a number of dubious *Elaphoglossum* records from Guadeloupe. Of these, the report of *E. brachyneuron* has now been confirmed, while those of *E. brevipes*, *E. cuspidatum*, and *E. villosum* have been referred to other species in the present work. The following have not been accounted for:

Elaphoglossum funckii (Fée) T. Moore, Ind. Fil. 9. 1857. (Based on a collection of L'Herminier.) This was probably a misidentification of the species now called *E. scandens*.

Elaphoglossum lepidotum (Willd.) J. Smith, Cat. Kew Ferns 1856. (Based on a collection of L'Herminier.)

Elaphoglossum lonchophyllum (Fée) T. Moore, Ind. Fil. 11. 1857. (Based on a collection of Mazé.)

Elaphoglossum pteropus C. Chr., Ind. Fil. 314. 1905. (Based on *Bory 17.*) Perhaps this is a misidentification of *E. martinicense.*

HYMENODIUM Fée

Hymenodium Fée, Mém. Fam. Foug. 2: 20. 1845. FIGURE 40.
Moderately-sized epiphytic ferns. Rhizome short, thick, woody, densely scaly. Fronds articulate, clustered, long-stipitate, clothed throughout with blackish hairlike scales. Blades simple, entire, and of fleshy texture, with veins completely anastomosing, the areoles narrowly elongate, rectangular to hexagonal, without included veinlets. Fertile blades similar to the sterile, but smaller. Sporangia, spores, and gametophytes similar to those of *Elaphoglossum.*

TYPE SPECIES: *Hymenodium crinitum* (L.) Fée, based on *Acrostichum crinitum* L., of pan-Caribbean distribution.

This genus is only moderately distinct from *Elaphoglossum*, to which it is obviously closely related, and is accepted here with some reluctance.

1. **Hymenodium crinitum** (L.) Fée, Mém. Fam. Foug. 2: 90. 1845.

Basionym: *Acrostichum crinitum* L., Sp. Pl. 2: 1068. 1753.
Type: Petiver, Pter. Amer. *t. 13, fig. 14.* This was copied by Petiver from Plumier, Tr. Foug. *t. 125*, which represents a plant from Morne de la Calebasse, Martinique. There is no specimen in the Linnaean Herbarium, and the species was evidently based solely on the Petiver drawing.
Syn.: *Dictyoglossum crinitum* (L.) J. Smith in Comp. Curt. Bot. Mag. 72: 18. 1846.
Chrysodium crinitum (L.) Mettenius, Fil. Hort. Lips. 21. 1856.
Elaphoglossum crinitum (L.) Christ, Mon. Elaph. 102. 1899.

Rhizome decumbent, 3–5 cm. thick, the scales of the apex thin, golden-brown, filiform and tortuous. Sterile fronds ascending or spreading, 40–90 cm. long; stipes shorter than the blades, densely spreading- or retrorse-scaly, the scales dark brown to blackish, abruptly capillary from a deltate-ovate base, 10–15 mm. long, deciduous; blades oval to elliptic-oblong, 25–60 cm. long, 12–25 cm. broad, rounded to broadly acute at the apex, more or less truncate at base, all parts deciduously scaly like the stipe. Fertile fronds long-stipitate, with blades half as long as the sterile fronds.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, Central America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On mossy tree trunks, rarely on rocks, at chiefly middle elevations.

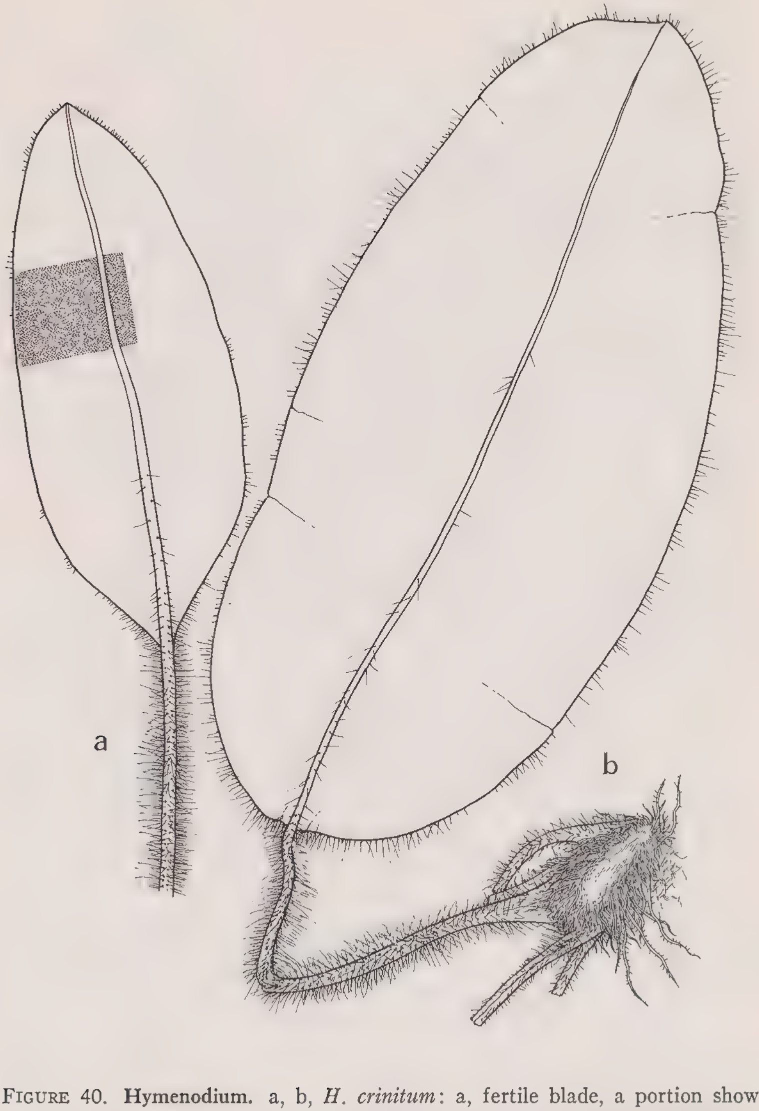

FIGURE 40. **Hymenodium.** a, b, *H. crinitum*: a, fertile blade, a portion showing sporangia covering the abaxial surface, × 0.5; b, habit, showing abundance of black hairlike scales on blade, stipe, and rhizome, × 0.5.

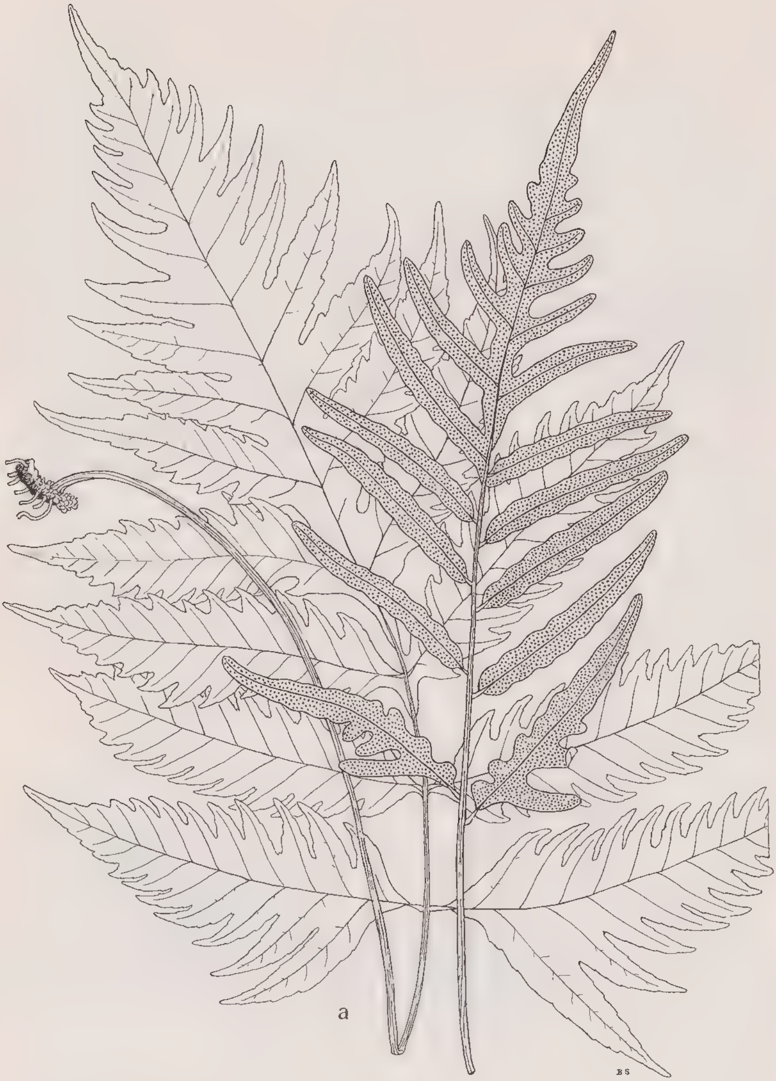

FIGURE 41. **Bolbitis.** a, *B. portoricensis*, sterile and fertile blades, × 0.4.

BOLBITIS Schott

Bolbitis Schott, Gen. Fil. *t. 14.* 1834. FIGURE 41.

Syn.: *Leptochilus* sensu Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 459. 1926, not Kaulf., 1824.

Terrestrial or subscandent ferns. Rhizomes creeping, scaly. Fronds dimorphic; stipes not articulate. Blades simple and entire to pinnate or pinnate-pinnatifid, glabrous, the fertile ones taller and much narrower than the sterile, or with narrower divisions, the veins reticulate, the areoles with or without free included veinlets. Sporangia completely covering the lower surface of the fertile blades; nonindusiate and without paraphyses; annulus of 14–16 cells, rarely less or more; spores globose, reticulate-flaky, -angular, -tuberculate, or -spinulose.

TYPE SPECIES: *Bolbitis serratifolia* (Mertens) Schott, based on *Acrostichum serratifolium* Mertens, of Brazil.

A pantropical genus of about 85 species, of which two are recorded from the Lesser Antilles.

KEY TO THE SPECIES

a. Pinnae entire, the terminal one separate and larger than the 1–4 pairs of lateral pinnae . . . . 1. *B. nicotianifolia*
a. Pinnae lobed, gradually reduced and becoming confluent toward apex of frond . . . . 2. *B. portoricensis*

1. **Bolbitis nicotianifolia** (Sw.) Alston in Kew Bull. 1932: 310. 1932.

Basionym: *Acrostichum nicotianifolium* Sw., Syn. Fil. 13, 199. 1806.
Type: *Ventenat*, from St. Thomas, Virgin Islands.
Syn.: *Acrostichum acuminatum* Willd. in L., Sp. Pl. **5**: 116. 1810. (Syntypes from Martinique and Peru.)
Gymnopteris acuminata (Willd.) C. Presl, Tent. Pter. 244. 1836.
Leptochilus nicotianifolius (Sw.) C. Chr. in Bot. Tidsskr. **26**: 285. 1904.

Plants terrestrial or subepiphytic. Rhizome woody, 5–7 mm. thick, wide-creeping or climbing, clothed chiefly at the apex with dark brown, lanceolate scales. Fronds few, 1–5 cm. apart. Sterile fronds up to 1 m. long; stipes usually shorter than the blades; lateral pinnae laxly oblique, narrowly pointed-oblong to elliptic-oval, abruptly long-acuminate, 15–25 cm. long, 5–9 cm. broad, equilateral and broadly cuneate or subrotund at base, mostly stalked, with ultimate venation prominulous and many of the areoles lacking free included veinlets. Fertile fronds long-stipitate; fertile pinnae up to 15 cm. long, mostly 1–2 cm. broad.

GENERAL DISTRIBUTION: Greater Antilles, St. Thomas, Trinidad, Central America from Guatemala to Panama.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, Grenada.

Habitat: Creeping or climbing at bases of trees or among rocks, in moist wooded ravines at lower to middle elevations.

2. **Bolbitis portoricensis** (Sprengel) Hennipman in Amer. Fern J. **65**: 30. 1975.

Basionym: *Acrostichum portoricense* Sprengel in Nova Acta Acad. Caes. Leop.-Carol. **10**: 226. 1821.

Type: *Bertero s.n.*, from Puerto Rico (G; isotypes P, TO) (as cited by Hennipman, 1975).

Syn.: *Acrostichum cladorrhizans* Sprengel, Nova Acta Acad. Caes. Leop.-Carol. **10**: 225. 1821.
Gymnopteris portoricensis (Sprengel) Fée, Mém. Fam. Foug. **2**: 85. 1845.
Acrostichum alienum var. *flagellum* Jenman in Bull. Bot. Dept. Jamaica II, **5**: 154. 1898.
Acrostichum alienum sensu Duss, Foug. & Lyc. Antill. Franc. 34. 1903, not Swartz, 1801.
Leptochilus cladorrhizans (Sprengel) Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 460. 1926.
Bolbitis cladorrhizans (Sprengel) Ching in C. Chr., Ind. Fil. Suppl. **III**: 47. 1934.

Plants terrestrial. Rhizome short-creeping, 8–15 mm. thick, clothed especially at the apex with dark brown, lance-attenuate scales. Fronds close; stipes stout, scaly toward base. Sterile fronds 40–140 cm. long. Blades deltate-oblong and long-acuminate (the apex sometimes viviparous), 30–60 cm. long, 20–50 cm. broad near the base, the lower part pinnate; basal pinnae stalked, unequally elongate-deltate, auriculate-excavate to the base, pinnately-lobed or pinnatifid; other pinnae mostly equilateral, sessile, deeply lobed, the vein areoles mostly with included, simple or branched, free veinlets. Fertile fronds shorter than the sterile but with longer stipes.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Colombia.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, Grenada.

Habitat: Moist rocky slopes and ravines, chiefly in rain forest areas at lower to middle elevations.

LOMARIOPSIS Fée

Lomariopsis Fée, Mém. Fam. Foug. **2**: 10, 66. 1845. Figure 42.

Syn.: *Stenochlaena* sensu Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 457. 1926, not J. Smith, 1841.

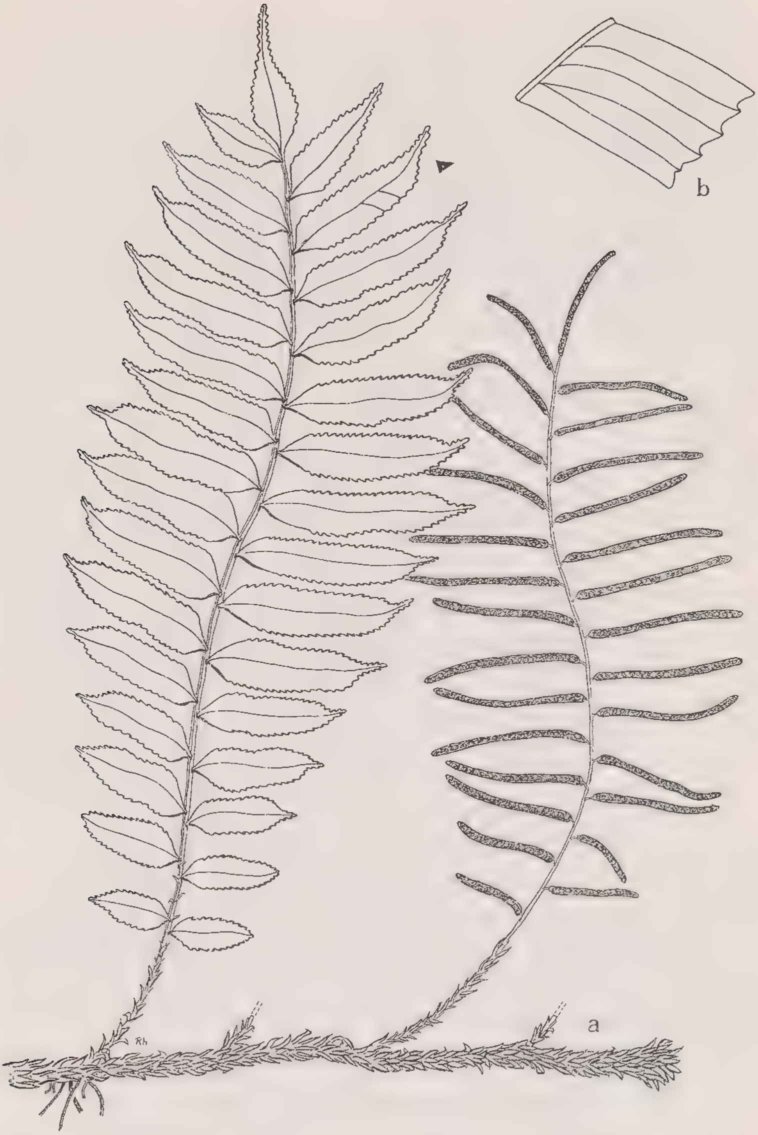

FIGURE 42. **Lomariopsis.** a, b, *L. sorbifolia*: a, habit, with sterile and fertile fronds, × 0.4; b, section of sterile blade showing venation, × 2.8.

Medium-sized scandent ferns. Rhizomes long-creeping or climbing, scaly, and "dorsiventral" (producing roots on one side and fronds on the other). Fronds scattered, short-stipitate. Blades 1-pinnate, and completely dimorphic; lateral pinnae articulate to the rhachis; sterile pinnae with free veins; fertile pinnae contracted, completely covered by sporangia beneath except for a thin, membranous border. Sporangia nonindusíate, with annulus of 14–22 cells; spores bilateral.

TYPE SPECIES: *Lomariopsis cochinchinensis* Fée, of the region from southeastern Asia to New Guinea.

A pantropical genus of about 40 species, one being recorded from the Lesser Antilles.

1. **Lomariopsis sorbifolia** (L.) Fée, Mém. Fam. Foug. 2: 69. 1845.

Basionym: *Acrostichum sorbifolium* L., Sp. Pl. 2: 1069. 1753, excl. ref. Jamaica.

Lectotype: Petiver, Pter. Amer., *t. 9, fig. 8.* This was copied by Petiver (as a reversed or mirror image) from Plumier, Tr. Foug. *t. 117*, which was based on a plant from Morne de la Calebasse, Martinique. Petiver's drawing is essentially the same as Plumier's except that one sterile frond has been removed. Plumier's Descr. Pl. Amer. *t. 12*, also cited by Linnaeus, shows the same plant but the fertile frond is omitted. The specimen of "*Acrostichum sorbifolium*" in the Linnaean herbarium is a different species.

Syn.: *Lomaria longifolia* Kaulf., Enum. Fil. 153. 1824. (Type: Plumier, Tr. Foug. *t. 117.*)
Stenochlaena longifolia (Kaulf.) J. Smith in J. Bot. Hook. 3: 402. 1841.
Stenochlaena sorbifolia (L.) J. Smith in J. Bot. Hook. 4: 149. 1841.
Lomariopsis sorbifolia var. *β caudata* Fée, Mém. Fam. Foug. 2: 70. 1845. (Type from Guadeloupe.)

Rhizome 5–10 mm. thick, with pale brown or pale reddish-brown, lance-linear, attenuate scales ca. 10 mm. long, filamentous-ciliate. Sterile fronds 50–75 cm. long; stipes scaly toward the base. Blades oblong, 12–22 cm. broad; rhachis narrowly winged; pinnae 15–20 pairs, alternate, lance-oblong, sessile or short-stalked, 1.5–2(–2.5) cm. broad, the margins sinuate-dentate, the veins prominulous; fertile pinnae ca. 3 mm. broad.

GENERAL DISTRIBUTION: Hispaniola, Puerto Rico.

DISTRIBUTION IN LESSER ANTILLES: Saba (?), St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Climbing on tree trunks or moist, shaded boulders in forest at lower and middle elevations.

POLYBOTRYA Humboldt & Bonpland ex Willdenow

Polybotrya Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 99. 1810.

FIGURE 43a, 43b.

Medium to large ferns. Rhizomes creeping or scandent, densely clothed with attenuate scales. Fronds long-stipitate; blades oblong to deltate, 1- to 3-pinnate, anadromic, and completely dimorphic. Sterile blades ample; tissue firm, the veins free or united by a submarginal strand. Fertile blades greatly contracted; ultimate divisions reduced to small spurs nearly or completely covered by sporangia; indusium lacking. Sporangia with annulus of 12–24 cells; spores bilateral, angular or subtuberculate.

TYPE SPECIES: *Polybotrya osmundacea* Humb. & Bonpl. ex Willd. of tropical America.

A genus of about 25 species, confined to the American tropics. Two species occur in the Lesser Antilles.

KEY TO THE SPECIES

a. Sterile fronds 1-pinnate; rhizome creeping, its scales nearly entire . . . . 1. *P. cervina*

a. Sterile fronds 2- to 3-pinnate; rhizome elongate-scandent, often climbing up tree trunks, its scales denticulate . . . . 2. *P. osmundacea*

1. **Polybotrya cervina** (L.) Kaulf., Enum. Fil. 55. 1824.

Basionym: *Osmunda cervina* L., Sp. Pl. **2**: 1065. 1753.

Lectotype: Plumier, Tr. Foug. *t. 154*, based on material from Morne Rouge, Martinique.

Syn.: *Asplenium juglandifolium* Lam., Encycl. Méth. Bot. **2**: 307. 1786.
Acrostichum cervinum (L.) Sw., Syn. Fil. 14. 1806.
Diplazium juglandifolium (Lam.) Sw., Syn. Fil. 91, 282. 1806, with regard to name only, not Hook., 1859 (see synonymy of *Diplazium flavescens*, p. 261).
Olfersia cervina (L.) Kunze in Flora (Regensburg) **7**: 312. 1824.
Dorcapteris cervina (L.) C. Presl, Epim. Bot. 167. 1852.

Rhizome 1–2 cm. thick, the loosely-tufted golden- or rusty-brown scales narrowly linear, 10–20 mm. long, 1 mm. broad, each with a tortuous hairlike apex. Fronds to 140 cm. long, erect; stipes scaly at base. Sterile blades narrowly oblong to oblong-oval, 30–85 cm. long, 20–35 cm. broad, glabrous; pinnae in 4–12 pairs, subopposite to alternate, lanceolate to lance-oblong, 3–7 cm. broad, unequally cuneate at base, the margins entire (rarely incised), the veins mostly forked at base, their apices united by an intramarginal vein. Fertile blades 2-pinnate.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, Central and South America.

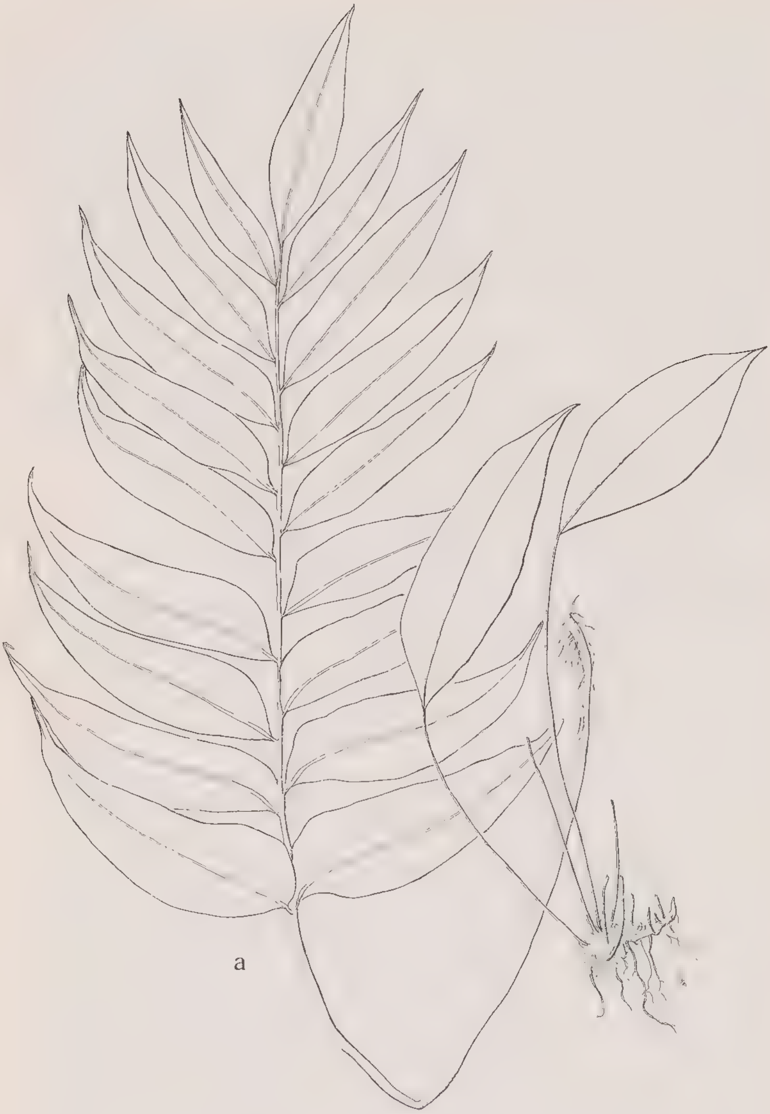

FIGURE 43a. **Polybotrya.** a, *P. cervina*, habit, sterile blade, × 0.2.

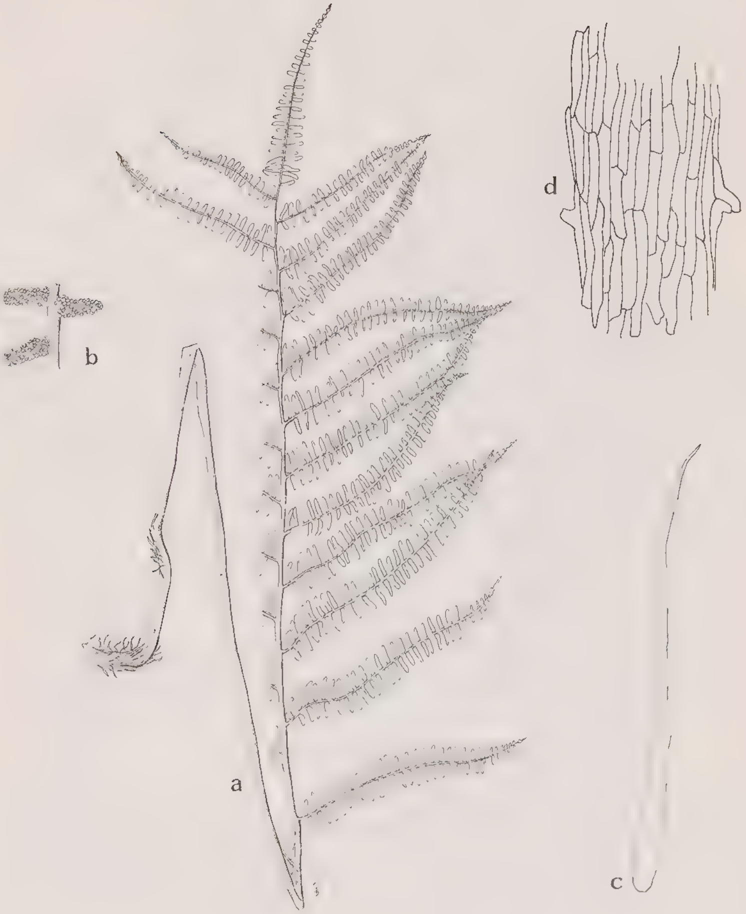

FIGURE 43b. **Polybotrya.** a–d, *P. cervina*: a, habit, fertile blade, × 0.3; b, section of fertile pinna, × 1.6; c, rhizome scale, × 4.0; d, section of scale showing cell structure, × 25.0.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Terrestrial or sometimes on mossy stumps and tree trunks in moist mountain forests at chiefly middle elevations.

2. **Polybotrya osmundacea** Humb. & Bonpl. ex Willd. in L., Sp. Pl. 5: 99. 1810.

Type: *Humboldt 459a* (fertile), *459b* (sterile), *Herb. Willd. 19507* (B).
Syn.: *Acrostichum osmundaceum* (Humb. & Bonpl. ex Willd.) Hook., Sp. Fil. 5: 246. 1864.
Polybotrya cyathifolia Fée & L'Herminier in Fée, Mém. Fam. Foug. 11: 6, *t. 2.* 1866. (Type from Guadeloupe.)

Rhizome woody, up to 5 m. long or more, 0.8–1.5 cm. thick, clothed with yellow- to dark-brown (rarely bicolorous), lance-attenuate scales up to 10 mm. long and 1 mm. broad, each with a contorted and hairlike apex and denticulate margins. Fronds arching, reaching 1.5 m. in length; stipes shorter than the blades. Sterile blades deltate or ovate-deltate, up to 1 m. long and broad; lowest pinnae the largest, glabrous but the rhachis slightly fibrillose beneath; ultimate segments oblong, acute, somewhat falcate, inequilateral toward base, the upper margins dentate or lobed, the veins free, 1- to 3-forked. Fertile blades much shorter than the sterile ones, 3-pinnate.

General Distribution: Greater Antilles except Puerto Rico; Trinidad, Central America, northern South America.

Distribution in Lesser Antilles: Guadeloupe, Grenada.

Habitat: Climbing on trees in rain forests at middle elevations.

NEPHROLEPIS Schott

Nephrolepis Schott, Gen. Fil. *t. 3.* 1834. Figure 44.

Plants terrestrial or epiphytic. Rhizomes erect and short (rarely elongate), densely clothed with scales, and usually proliferating by means of elongate slender stolons. Fronds clustered, crowded, not articulate to the rhizome. Blades linear to linear-oblong, normally 1-pinnate (more dissected forms are common in horticulture), the apex often appearing of indeterminate growth; pinnae numerous, articulate to the rhachis and eventually deciduous, the veins free, 1- to 4-forked, all but the fertile ones reaching nearly to the margins, with ends thickened and often secreting a small white scale of calcium carbonate on the upper (adaxial) side. Sori terminal on the first distal vein branches, medial to submarginal, in a single row on either side of the midvein; indusium lunate to orbicular, attached at the sinus. Spores bilateral.

Type species: *Nephrolepis exaltata* (L.) Schott, based on *Polypodium exaltatum* L. of the American tropics.

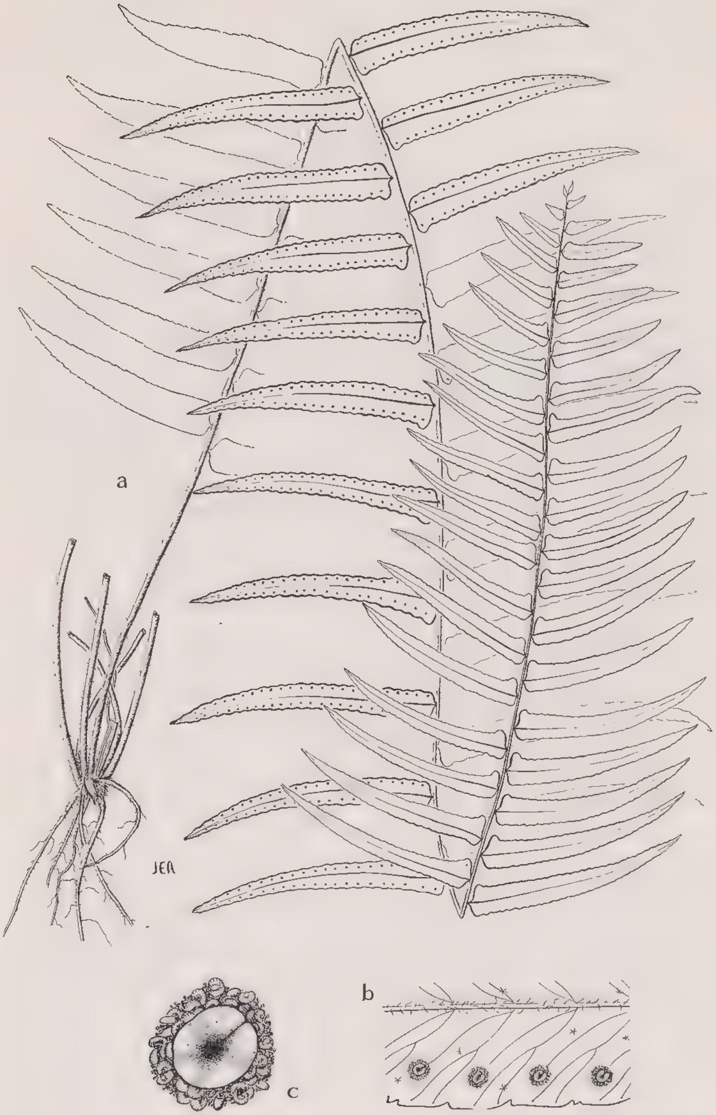

FIGURE 44. **Nephrolepis.** a–c, *N. biserrata*: a, habit, × 0.4; b, section of pinna showing venation and sori, × 2.8; c, enlarged sorus, × 12.0.

A pantropical genus of about 30 species, some of them difficult to distinguish. Two species appear to be indigenous to the Lesser Antilles; one is widely naturalized; and others may occur under cultivation or as escapes from gardens.

KEY TO THE SPECIES

a. Midvein of pinnae glabrous on upper side, or else bearing a few scattered flexuous hairs 0.5–1 mm. long; stipe scales spreading, rather loose.
  b. Pinnae all sessile, 2.5–6 cm. long, truncate and acutely short-auriculate at acroscopic side of base, the undersurface glabrous and very minutely stellate-scaly . . . . 1. *N. rivularis*
  b. Pinnae (or some of them) petiolate, 8–20 cm. long, often broadly cuneate at base, usually hirtellous at least on costa beneath . . 2. *N. biserrata*
a. Midvein of pinnae on upper side densely clothed with very short (0.2–0.3 mm.) straight, pale brown pluricellular hairs; stipe scales (or most of them) closely appressed, dark brown with pale minutely fibrillose margins . . . . 3. *N. multiflora*

1. Nephrolepis rivularis (Vahl) C. Chr., Ind. Fil. 455. 1906.

Basionym: *Polypodium rivulare* Vahl, Eclog. Amer. 3: 51. 1807.
Type: *Ryan*, from Montserrat.
Syn.: *Aspidium sesquipedale* Willd. in L., Sp. Pl. 5: 230. 1810. (Type from Brazil.)
  Aspidium eminens Wikstr. in Kongl. Sv. Vet. Akad. Handl. **1825**: 436. 1826. (Type from Guadeloupe.)
  Nephrodium crenatum Desvaux in Mem. Soc. Linn. Paris 6: 252. 1827. (Type from "Trop. America.")
  Nephrolepis sesquipedale (Willd.) C. Presl, Tent. Pter. 79. 1836.
  Nephrolepis exaltata sensu Duss, Foug. & Lyc. Antill. Franc. 105. 1903, not (L.) Schott, 1834.
  Nephrolepis rivularis var. *dominicensis* Domin, Pter. Dominica 237. 1929. (Type from Dominica.)

Rhizome erect, densely clothed with lance-attenuate, dark brown scales, these with pale brown, ciliate margins; stolons numerous. Fronds 60–200 cm. long, with very short stipes. Blades slightly narrowed below; rhachis brown, fibrillose-scaly; pinnae 6–11 mm. broad at the middle, the margins distantly appressed-serrulate toward the base, and singly or doubly crenate-serrate toward the somewhat acute apex.

GENERAL DISTRIBUTION: Greater Antilles, Virgin Islands, Tobago, Trinidad, continental tropical America from Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Terrestrial or epiphytic in mesophytic to moist forest. This is the commonest species of its genus in the Lesser Antilles.

2. **Nephrolepis biserrata** (Sw.) Schott, Gen. Fil. *under t. 3.* 1834.

Basionym: *Aspidium biserratum* Sw. in J. Bot. Schrader **1800**(2): 32. 1801.
Type: *Groendal*, from Mauritius.
Syn.: *Polypodium punctulatum* Poiret in Lam., Encycl. Méth. Bot. **5**: 533. 1804. (Type from Martinique.)
Aspidium punctulatum (Poiret) Sw., Syn. Fil. 46. 1806.
Nephrolepis punctulata (Poiret) C. Presl, Tent. Pter. 79, *t. 2, fig. 14.* 1836.
Nephrolepis subcordata C. Presl, Tent. Pter. 79. 1836. (nomen); Epim. Bot. 43. 1851. (Type from Martinique.)

Rhizome erect, to 25 cm. long, woody, densely clothed at apex with lance-attenuate, lustrous brown, sparingly ciliate and denticulate, hair-pointed scales; stolons numerous. Fronds 1–5 m. long, often arching or pendent. Blades slightly narrowed below; rhachis pale brown, finely fibrillose-scaly; pinnae 12–25 mm. broad, the margins varying from finely dentate-serrulate in sterile pinnae to crenate in fertile ones, the crenations often minutely toothed; tissue sparsely whitish-hirtellous beneath (or sometimes nearly glabrous), occasionally also with small, pale brown, stellate-fimbriate scales.

General Distribution: Pantropical.

Distribution in Lesser Antilles: Antigua, St. Eustatius, St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: Steep, partly shaded banks and on the trunks or forks of large trees, especially in or near swamps, at low to middle elevations.

3. **Nephrolepis multiflora** (Roxb.) Jarrett ex Morton in Contr. U. S. Nat. Herb. **38**: 309. 1974.

Basionym: *Davallia multiflora* Roxb. in Calcutta J. Nat. Hist. **4**: 515, *t. xxxi, left-hand.* 1844.
Lectotype: *Roxburgh* (BR) (as selected by Morton, 1974).

Rhizome short, woody, erect, clothed especially at the apex with lance-attenuate, mahogany- to dark-brown adpressed scales, these with pale, finely fimbriate-ciliate margins; similar scales on stipe and rhachis, becoming progressively smaller above; stolons numerous, wiry. Fronds 15–120 cm. long, the stipes relatively very short. Blades narrowed at base; pinnae 2–7.5 cm. long, 0.5–1.2 cm. broad above the auricled base, the base sessile and subcordate with the acroscopic auricle often overlapping the rhachis, the margins bluntly serrulate to finely crenate. Sori submarginal, with nearly orbicular indusium.

General Distribution: India; naturalized in widely scattered tropical areas, including southern Florida, the Bahamas, and the Greater Antilles.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Old pastures, thickets, roadside banks, among boulders beside streams, and in exposed areas of volcanic ash, at lower to middle elevations.

Many specimens of this species have previously been misidentified as *Nephrolepis exaltata*, which it resembles in habit. However, the dark brown adpressed scales on the stipe and rhachis of *N. multiflora* are distinctive, as are other characters. The mode and time of introduction of this species from its native region are unknown, but it can now be considered as thoroughly established in the West Indies.

SPECIES IN CULTIVATION

The following forms may also be found, usually under cultivation or escaped from cultivation:

Nephrolepis cordifolia (L.) C. Presl, Tent. Pter. 79. 1836, with narrow fronds, the stolons often bearing small, scaly tubers. Tuberless clones are known.

Nephrolepis cordifolia (?) cv. 'Duffii' (*N. cordifolia* f. *duffii* (T. Moore) Proctor in Bull. Inst. Jam. Sci. Ser. 5: 42. 1953), with small orbicular or twined-orbicular pinnae and usually forked rhachises, nearly always sterile and lacking tubers.

Nephrolepis exaltata cv. 'Boston fern' (*N. exaltata* var. *bostoniensis* Davenport in New England Florist 2: 137. 1896), a variable, more or less finely dissected form which occasionally reverts wholly or in part to the typical 1-pinnate condition.

Nephrolepis falcata (Cav.) C. Chr. cv. 'Furcans' (*N. falcata* f. *furcans* (T. Moore in Nicholson) Proctor in Rhodora 63: 32. 1961), the "fishtail fern" often cultivated in the West Indies, with pinnae and sometimes the rhachis forked 1–several times. It is usually filed in herbaria as a form of *N. biserrata*, but this identification is incorrect. This form apparently originated in Australia or New Guinea.

Nephrolepis hirsutula (Forst.) C. Presl cv. 'Superba', a hairy, always sterile form with deeply and irregularly incised pinnae, frequently cultivated in Lesser Antillean gardens. It sometimes persists or spreads from abandoned cultivations, and occasionally may revert to the typical form.

Specimens identified as typical *Nephrolepis hirsutula* have been collected at several West Indian localities (including St. Vincent), but the present writer considers these identifications doubtful. This species is indigenous to tropical Asia and islands of the Pacific Ocean. It is most likely to be confused with small forms of *N. biserrata*, from which it differs in the distinctly auricled pinnae with sori closer to the margins, and in the presence of dark convex scales on old stipes. The last character suggests a close relationship to *N. multiflora*.

DOUBTFUL RECORDS

Nephrolepis exaltata (L.) Schott has been reported from the Lesser Antilles in various publications, but it is now believed that all these records pertain either to *N. rivularis* or *N. multiflora.*

Nephrolepis pectinata (Willd.) Schott has been tentatively identified by R. Tryon from St. Kitts on the basis of a single sterile specimen (*R. Wadsworth 656*). In my opinion, this is a juvenile plant of *N. rivularis.*

CYCLOPELTIS John Smith

Cyclopeltis J. Smith in Comp. Curt. Bot. Mag. 72: 36. 1846.
FIGURE 45.

Medium-sized terrestrial ferns. Rhizomes mostly erect, thick, woody, bearing numerous scales. Fronds clustered, with uniform blades. Blades 1-pinnate; pinnae elongate, articulate to the rhachis and eventually deciduous, with veins mostly free, forked, the branchlets anadromic in sequence. Sori round, in 1–4 rows on either side of the costa; indusium round, centrally peltate. Sporangia with annulus of 14–16 cells; spores bilateral, oblong to globose, with thick perispore that wrinkles to become tuberculate.

TYPE SPECIES: *Cyclopeltis semicordata* (Sw.) J. Smith, based on *Polypodium semicordatum* Sw. of the American tropics.

This genus consists of the type species, native to the New World, and five other species that range from southeast Asia to the Solomon Islands.

1. **Cyclopeltis semicordata** (Sw.) J. Smith in Comp. Curt. Bot. Mag. 72: 36. 1846.

Basionym: *Polypodium semicordatum* Sw., Prodr. 132. 1788.
Type: *Swartz,* from Jamaica.
Syn.: *Aspidium semicordatum* (Sw.) Sw. in J. Bot. Schrader **1800**(2): 31. 1801.
Polystichum semicordatum (Sw.) T. Moore, Ind. Fil. lxxxiv. 1857.
Hemicardion nephrolepis Fée, Mém. Fam. Foug. **5**: 282. 1852.

Rhizome 1.5–3 cm. thick, densely clothed at apex with yellow-brown, linear-attenuate scales up to 25 mm. long or more. Fronds to 1.5 m. long, glabrous; stipe grooved, relatively short. Blades narrowly to broadly oblanceolate, 12–30 cm. broad, the apex abruptly acuminate; pinnae numerous, sessile, 1–2 cm. broad, auricled at base on the basiscopic side, the margins entire or slightly sinuate, the veins alternately 3- to 5-forked. Sori in 1 to 3 rows nearer to the costa than to the margins.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Bolivia.

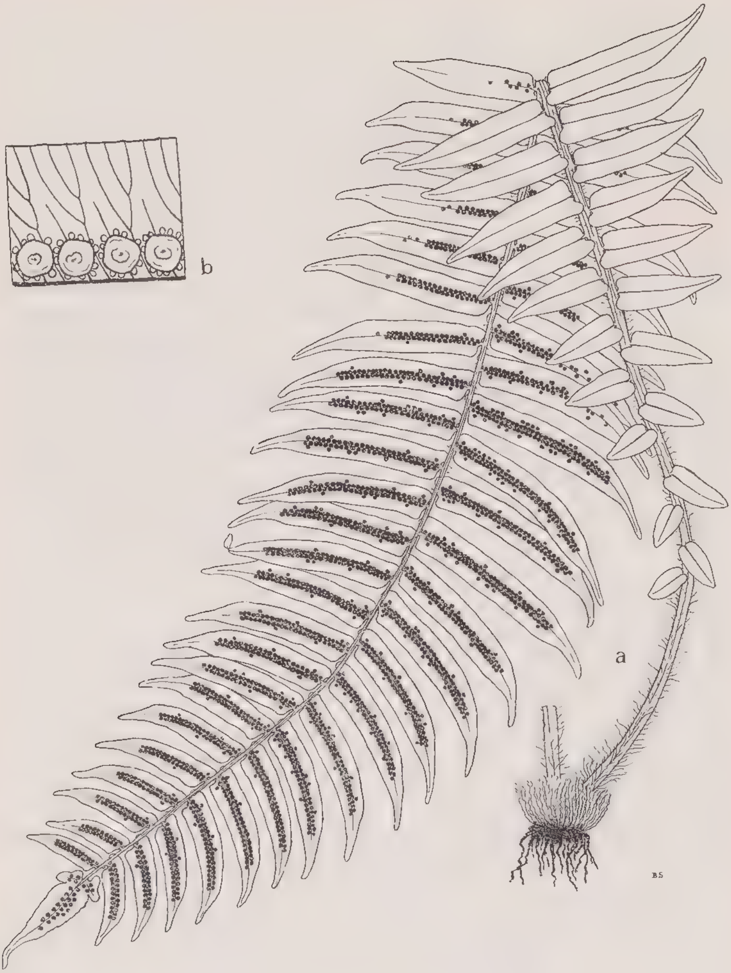

FIGURE 45. **Cyclopeltis.** a, b, *C. semicordata*: a, habit, × 0.4; b, section of pinna showing sori along the costa, and venation, × 3.2.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, St. Vincent, Grenada, Barbados.

HABITAT: Moist rocky woods, most often on limestone, at lower and middle elevations.

HYPODERRIS R. Brown

Hypoderris R. Br. in Wallich, Plant. Asiat. Rar. 1: 16. 1830; Hook. & Bauer, Gen. Fil. *t. 1.* 1838. FIGURE 46.

A terrestrial fern of small to moderate size. Rhizomes slender, creeping, densely scaly, 10–15 cm. long, 3–5 mm. thick, the scales brown, subclathrate, lance-attenuate, up to 5 mm. long. Fronds few, scattered, 30–85 cm. long, stipitate, with simple blades; stipes dull purple-brown, densely clothed with scales like those of the rhizome. Blades subcordate to hastate-lobate at base, often constricted above, acuminate at the apex, with margins entire or sinuate, the veins reticulate, the areoles with or without a short, included, free veinlet. Sori roundish, scattered; indusium attached beneath, shallowly lobed, fimbriate-ciliate, soon hidden by the sporangia. Sporangia with annulus of ca. 14 cells; spores oblong, spinulose.

TYPE SPECIES: *Hypoderris brownii* J. Smith, of tropical America.

1. **Hypoderris brownii** J. Smith in Hook. & Bauer, Gen. Fil. *t. 1.* 1838.

Type: Probably a specimen cultivated at Kew, originating in Trinidad. I have not seen the Kew material of this species, but probably a suitable lectotype would not be difficult to designate.

Syn.: *Woodsia brownii* (J. Smith) Mettenius, Fil. Hort. Lips. 98. 1856.

Characters as given above for the genus.

GENERAL DISTRIBUTION: Hispaniola, Puerto Rico, Trinidad, Venezuela.

DISTRIBUTION IN LESSER ANTILLES: Grenada.

HABITAT: Moist shaded ravines and cliffs, occasionally on boulders in stream beds, at chiefly middle elevations.

A good illustration of this species is W. J. Hooker, *Garden Ferns t. 24.* 1862.

TECTARIA Cavanilles

Tectaria Cav. in An. Hist. Nat. Madrid 1: 115. 1799. FIGURE 47.

Medium to large terrestrial ferns of moist (often rocky) forests. Rhizomes woody, short-creeping to erect, scaly at the apex. Fronds clustered, simple to pinnate or pinnately compound; divisions usually broad with entire or sparingly incised margins and reticulate venation, the areoles with or without free included veinlets. Sori mostly round (some-

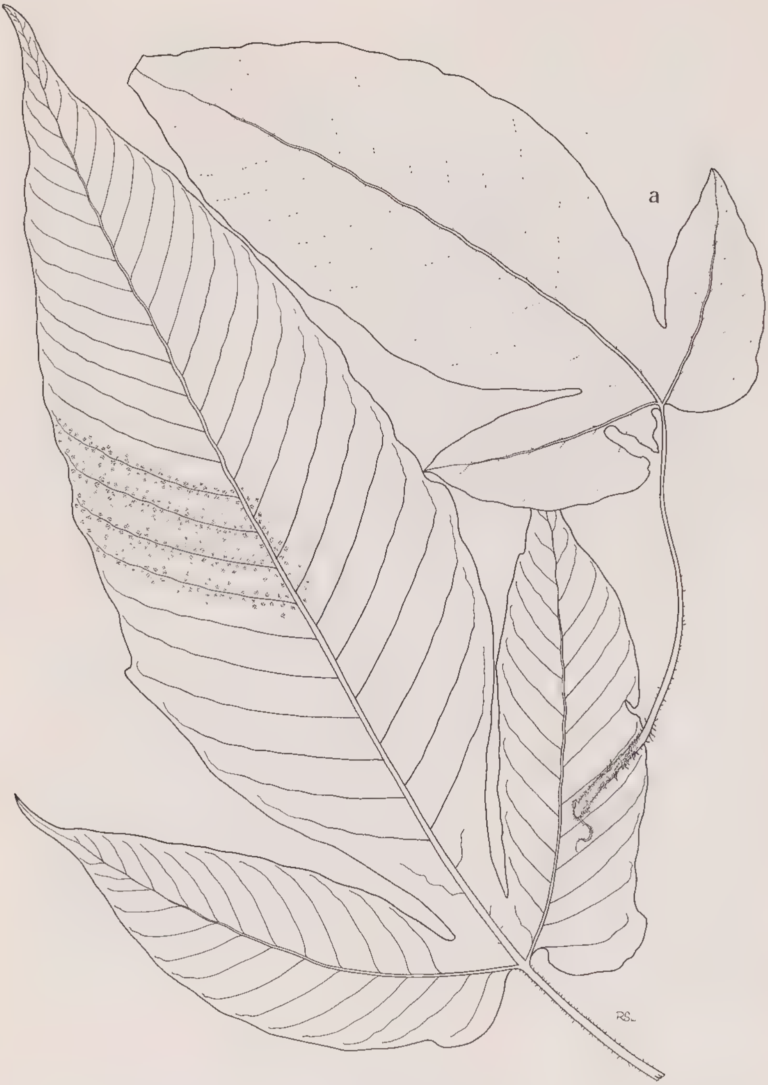

FIGURE 46. **Hypoderris.** a, *H. brownii,* habit, a portion of the blade with sori, × 0.4.

times elongate or irregular), scattered or borne in open rows; indusium peltate, reniform, or apparently sometimes lacking. Sporangia with annulus of ca. 14 cells; spores oblong with thick perispore, becoming tuberculate or spinulose.

TYPE SPECIES: *Tectaria trifoliata* (L.) Cav., based on *Polypodium trifoliatum* L. of tropical America.

A large pantropical genus of about 200 described species; the number of valid names will probably be less when the group has been properly studied. Four species are recorded from the Lesser Antilles.

SPECIAL LITERATURE: Underwood, American ferns — VI. Species added to the flora of the United States from 1900 to 1905, in Bull. Torrey Bot. Club 33: 189–205. 1906; Morton, The Mexican species of Tectaria, in Amer. Fern J. 56: 120–137. 1966.

There is no general monograph of Tectaria; however, consulting the references listed above will provide a treatment of all the species occurring in the Lesser Antilles.

KEY TO THE SPECIES

a. Blades simple, often viviparous; indusium lacking ...... 1. *T. plantaginea*
a. Blades pinnate, not viviparous; indusium present or usually so.
  b. Indusium orbicular, entire, centrally peltate .... 2. *T. heracleifolia*
  b. Indusium reniform or notched, attached at the sinus.
    c. Pinnae usually 1 to 2 pairs (rarely as many as 4); sori irregularly scattered (rarely obscurely biseriate); indusium with fimbriate margins, soon shriveling .... 3. *T. trifoliata*
    c. Pinnae usually 3 to 8 pairs; sori distinctly biseriate, mostly restricted to a row on either side of the costules (secondary veins); indusium margin not fimbriate (sometimes minutely glandular) .. 4. *T. incisa*

1. **Tectaria plantaginea** (Jacq.) Maxon in Contr. U. S. Nat. Herb. 10: 494. 1908.

Basionym: *Polypodium plantagineum* Jacq., Coll. Bot. 2: 104, *t. 3, fig. 1.* 1788.
Type: *Jacquin*, from Martinique, the specimen probably no longer extant. If so, Jacquin's plate, cited above, can serve as lectotype.
Syn.: *Polypodium latifolium* Vahl, Eclog. Amer. 3: 50. 1807, not G. Forster, 1786. (Type from Montserrat.)
Podopeltis plantaginea (Jacq.) Fée, Mém. Fam. Foug. 5: 9. 1850.
Dryomenis plantaginea (Jacq.) J. Smith in Seem., Bot. Voy. Herald 229. 1854.
Aspidium plantagineum (Jacq.) Griseb. in Abh. Ges. Wiss. Gött. 7: 286. 1857.
Bathmium plantagineum (Jacq.) Fourn. in Bull. Soc. Bot. France 19: 254. 1872.

Rhizome creeping, 3–7 mm. thick, clothed with lanceolate, entire, blackish-brown scales up to 4 mm. long. Fronds closely 2-ranked, 20–

60 cm. long; stipes laxly scaly, much shorter than the blades. Blades oblong to oblanceolate or elliptic, 12–50 cm. long, 2–11 cm. broad, subrotund to somewhat acute at both ends, the apex often emarginate and proliferous; rhachis sparingly scaly beneath like the stipe, with margins entire to sinuate, not ciliate; tissue dark dull green, opaque, glabrous, the ultimate venation obscure, the areoles in 4 or 5 rows between the costules and often with a free included veinlet. Sori irregularly biseriate between the costae, typically round.

GENERAL DISTRIBUTION: Puerto Rico, Tobago, Trinidad, continental tropical America from Belize to Peru and Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On rocks and clay banks in moist, deeply shaded ravines, or occasionally on floor of tall primary rain forest, at chiefly middle elevations.

1a. **Tectaria plantaginea var. confluens** Morton in Amer. Fern J. 56: 123. 1966.

Type: *A. C. Smith 10270*, from Fresh Water Lake, near Laudat, Dominica (US).

This variety is characterized by having the sori irregularly elongate rather than round. It is known in the Lesser Antilles only from Dominica; elsewhere it is recorded from Puerto Rico, Tobago, and Trinidad.

2. **Tectaria heracleifolia** (Willd.) L. M. Underw. in Bull. Torrey Bot. Club 33: 200. 1906.

Basionym: *Aspidium heracleifolium* Willd. in L., Sp. Pl. 5: 217. 1810, excl. ref. Philippine Islands.

Lectotype: Plumier, Tr. Foug. *t. 147*, based on a plant from Hispaniola. In the Willdenow Herbarium at Berlin there is a Venezuelan specimen of this species (*Bredemeyer, Herb. Willd. 19735, sheet 1a*) that might be considered the holotype. However, Willdenow's description and comments suggest that the Hispaniola plant illustrated by Plumier formed the primary basis of his species. In any case, the application of the name is not in doubt.

Syn.: *Bathmium heracleifolium* (Willd.) Fée, Mém. Fam. Foug. 5: 287. 1852.
Aspidium trifoliatum var. *heracleifolium* (Willd.) Husnot, Cat. Crypt. Antill. Franc. 41. 1870.
Tectaria trifoliata var. *heracleifolia* (Willd.) Farwell in Amer. Midl. Nat. 12: 261. 1931.
Tectaria trifoliata sensu Millsp. in Field Mus. Nat. Hist. (Bot. Ser.) 3: 3. 1903, not Cav., 1802.

Rhizome erect, 1–2 cm. thick, the apex bearing a small dense tuft of dark brown, narrowly lance-attenuate, hair-pointed scales 2–5 mm. long.

Fronds clustered, 30–85 cm. long; stipes grooved, longer than the blades and sparsely scaly toward the base. Blades deltate-ovate, 15–30(–45) cm. long, 15–25 cm. broad, more or less pentagonal in outline, pinnately 3-foliate or sometimes with 2 pairs of lateral pinnae; basal pinnae the largest, stalked, usually deeply 2- to 3-lobed, with the terminal lobe largest, all elongate and often coarsely crenate-dentate or incised; terminal pinna deltate, pinnately cleft, with a pair of long-acuminate, oblique basal lobes; tissue firmly papery, glabrous, the venation complexly reticulate, many of the areoles with one or more free included veinlets. Sori biseriate along the costules, 2–3.5 mm. in diameter; indusium minutely glandular-puberulous, persistent.

General Distribution: Florida, Bahamas, Greater Antilles, continental tropical America from Mexico to Peru and Venezuela.

Distribution in Lesser Antilles: Antigua, Saba, St. Kitts, Montserrat, Guadeloupe, La Desirade, Marie Galante, Dominica, Martinique, St. Vincent, Barbados.

Habitat: Shaded rocky banks and hillsides in forests at lower to middle elevations. The distribution indicates some affinity with limestone.

3. **Tectaria trifoliata** (L.) Cav., Descr. Pl. 249. 1802.

Basionym: *Polypodium trifoliatum* L., Sp. Pl. 2: 1087. 1753, excl. ref. Sloane.
Lectotype: *Plumier*, Tr. Foug. *t. 148* (= Descr. Pl. Amer. *t. 32*) (as selected by L. M. Underw. in Bull. Torrey Bot. Club 33: 199. 1906), representing a plant from "le long du chemin de la Cabsterre proche la riviere Falaise," Martinique.
Syn.: *Aspidium trifoliatum* (L.) Sw. in J. Bot. Schrader **1800**(2): 30. 1801.
Aspidium plumieri C. Presl, Rel. Haenk. **1**: 29. 1825. (Type from Haiti.)
Aspidium parallelum Desvaux in Mém. Soc. Linn. Paris **6**: 245. 1827. (Type from "Amer. calidiore.")
Bathmium trifoliatum (L.) Link, Fil. Hort. Berol. 114. 1841.
Cardiochlaena trilobata Fée, Mém. Fam. Foug. **5**: 316. 1852. (Type from French Antilles.)
Cardiochlaena confluens Fée, Mém. Fam. Foug. **5**: 316. 1852. (Type from Guadeloupe.)
Sagenia confluens (Fée) T. Moore, Ind. Fil. 228. 1861.
Aspidium trifoliatum var. *amplum* Hook., Sp. Fil. **4**: 45. 1862. (Type from St. Vincent.)
Nephrodium sherringiae Jenman in J. Bot. **25**: 99. 1887. (Type from Trinidad.)
Nephrodium domingense Baker in Ann. Bot. **5**: 329. 1891. (Type from Dominica, not "St. Domingo.")
Aspidium purdiaei Jenman in Gard. Chron. III, **22**: 282. 1897. (Type from Trinidad.)
Aspidium domingense (Baker) C. Chr., Ind. Fil. 72. 1905.
Aspidium psammiosorum C. Chr., Ind. Fil. 89. 1905. (A renaming of *Nephrodium sherringiae* Jenman 1887, not 1879.)
Tectaria plumieri (C. Presl) Copel. in Philip. J. Sci. **2**: 410. 1907.

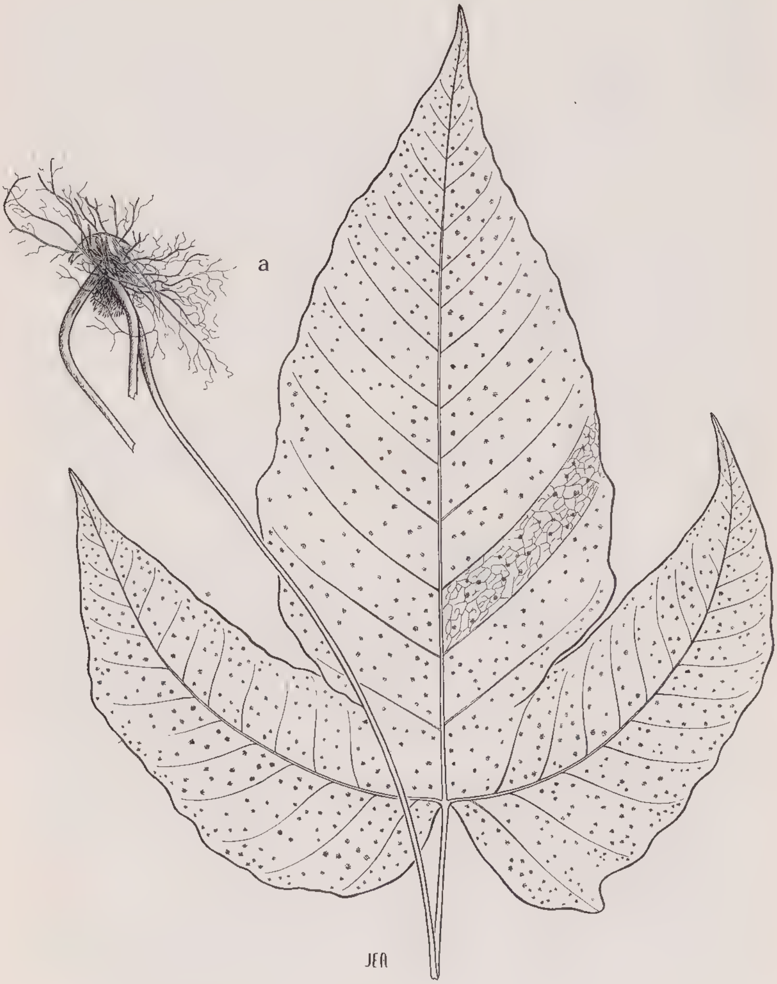

FIGURE 47. **Tectaria.** a, *T. trifoliata*, habit, a portion of the blade with venation, × 0.4.

Tectaria trifoliata f. *megasora* Domin, Pter. Dominica 229. 1929. (Type from Dominica ?)
Tectaria trifoliata var. *menispermifolia* Domin, Pter. Dominica 230. 1929. (Type from Dominica.)

Rhizome decumbent to suberect, 2–3 cm. thick, clothed at apex with rigid, dark brown, lance-attenuate scales, these up to 8 mm. long, and with margins very sparsely and minutely denticulate-ciliolate. Fronds variable, up to 1.5 m. long but usually much smaller; stipes longer than or about equalling the blades, purple-brown at base, naked except for a few scattered scales near the base. Smaller blades chiefly 20–40 cm. long, 15–30 cm. broad, ternately lobed with a deeply cordate base, or pinnately 3-foliate, the basal pinnae inequilateral, elongate-deltate, usually with a blunt to acuminate basal lobe; larger blades chiefly 40–70 cm. long, 25–55 cm. broad, with 1–2(–4) pairs of lateral pinnae; basal pinnae long-stalked and sometimes pinnately parted at the base; terminal pinna 10–25 cm. broad, broadly ovate to subhastate; tissue papery, glabrous, with complexly reticulate venation, the areoles mostly with included free veinlets. Sori numerous, relatively small, irregular in shape, varying from round to lunate or elongate (up to 4 mm. long, 0.5 mm. broad).

GENERAL DISTRIBUTION: Greater Antilles except Jamaica; Tobago, Trinidad, northern South America. Reports of this species from elsewhere are usually due to misidentifications of *T. heracleifolia*.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Moist rocky ravines in rain forest areas at chiefly middle elevations.

4. **Tectaria incisa** Cav., Descr. Pl. 249. 1802.

Type: *Ventenat*, from Puerto Rico.
Syn.: *Polypodium expansum* Poiret in Lam., Encycl. Méth. Bot. **5**: 523. 1804. (Type from "Amerique.")
Aspidium martinicense Sprengel, Anleit. Gewächse 3: 133. 1804. (Although attributed to Martinique by Sprengel, the material on which this species was based actually was collected in Santo Domingo by Poiteau (see Morton in Amer. Fern J. **56**: 129. 1966).)
Aspidium macrophyllum Rudolphi in Bemerk. Geb. Naturg. **2**: 103. 1805; Sw., Syn. Fil. 43, 239. 1806. (A renaming of *A. martinicense* Sprengel because the correct source locality made the epithet "martinicense" inappropriate; Rudolphi had supplied Sprengel with his original specimen.)
Polypodium repandum Vahl, Eclog. Amer. **3**: 53. 1807, not Sw., 1801. (Type from Montserrat.)
Aspidium longifolium Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 319. 1811. (Type from "Antilles.")

Aspidium expansum (Poiret) Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 320. 1811.
Nephrodium expansum (Poiret) Desvaux in Mém. Soc. Linn. Paris **6**: 261. 1827.
Bathmium macrophyllum (Rudolphi) Link, Fil. Hort. Berol. 114. 1841.
Cardiochlaena macrophylla (Rudolphi) Fée, Mém. Fam. Foug. **5**: 315. 1852.
? *Cardiochlaena ampla* Fée, Mém. Fam. Foug. **5**: 315. 1852. (Type from Guadeloupe.)
Sagenia macrophylla (Rudolphi) T. Moore, Ind. Fil. lxxxvi. 1857.
? *Sagenia ampla* (Fée) T. Moore, Ind. Fil. 228. 1861.
Nephrodium macrophyllum (Rudolphi) Baker in Hook. & Baker, Syn. Fil. 300. 1867.
Dryopteris martinicensis (Sprengel) Kuntze, Rev. Gen. Pl. **2**: 812. 1891.
Tectaria martinicensis (Sprengel) Copel. in Philip. J. Sci. **2**: 410. 1907.
Bathmium martinicense (Sprengel) Nakai in Bot. Mag. Tokyo **40**: 68. 1926.
Sagenia martinicensis (Sprengel) Farwell in Amer. Midl. Nat. **12**: 259. 1931.

Rhizome erect, 1.5–3 cm. thick, the apex densely clothed with dark brown, lance-deltate, denticulate-fimbriate scales, these 3–7 mm. long and 1–2 mm. broad near base. Fronds clustered, to 1.5 m. long; stipes yellowish, grooved, about equalling the blades. Blades oblong to ovate-oblong, pinnate, 30–75 cm. long, 20–50 cm. broad; rhachis grooved on upper side, minutely septate-puberulous in the channel; pinnae oblique, the basal pair excavate on basiscopic side at base and deeply 2-lobate, the lower division shorter than the upper; other lateral pinnae oblong or linear-oblong, acuminate to attenuate-caudate, 1–6 cm. broad, sometimes slightly constricted above the inequilateral, semiadnate base, with margins slightly to coarsely sinuate; terminal pinna confluent with the uppermost lateral pinnae; tissue thinly papery, normally glabrous (a pilose variety has been described, but has not been found in the Lesser Antilles), with complexly reticulate venation, the areoles often with a free included veinlet. Sori round; indusium persistent, round-reniform, often appearing peltate by overlapping of the basal lobes.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Bolivia and Brazil.

Distribution in Lesser Antilles: Antigua, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada (?), Barbados.

Habitat: Forested slopes and shaded ravines at lower to middle elevations. This species shows some affinity with limestone.

Material of what appears to be a hybrid between *Tectaria incisa* and *T. trifoliata* has been collected in Nevis (*Proctor 19393*).

DOUBTFUL RECORD

Aspidium pentaphyllum Willd. in L., Sp. Pl. **5**: 216. 1810, was based on Plumier's Tr. Foug. *t. 114*, from a plant found by Plumier in Martinique. Christensen (Ind. Fil. 87. 1905) suggested a relationship with *Tectaria trifoliata*, but, judging by the plate, it seems very different from that species. In any case, if it should eventually prove to be a *Tectaria* and a valid species, it cannot bear the epithet *pentaphylla*, already used in *Tectaria* for a New Guinea species.

CTENITIS (C. Christensen) C. Christensen & Ching

Ctenitis (C. Chr.) C. Chr. & Ching in Bull. Fan Mem. Inst. Biol., Bot. Ser. **8**: 275. 1938. FIGURE 48.

Basionym: *Dryopteris* subg. *Ctenitis* C. Chr., Biol. Arb. tilegn. Eug. Warming 77. 1911.

Terrestrial ferns mostly of medium to large size. Rhizomes erect or ascending (rarely elongate and creeping), densely clothed at apex with conspicuous scales, these attenuate or hairlike at apex and often with toothed or ciliate margins (similar but smaller hairs also occur on base of stipes). Blades pinnate-pinnatifid to 4-pinnate or decompound, membranous in texture, catadromic, and often more or less deltate, the vascular parts scaly beneath (scales often toothed) and clothed on upper side with numerous short, articulate (pluricellular) hairs; aerophores lacking; ultimate divisions usually rounded or obtuse, the margins glabrous or ciliate, the veins all free, simple or branched, reaching the margins or not. Sori round, dorsal on veins; indusium (if present) round-reniform, attached at the sinus. Sporangia glabrous, with annulus of 14–16 cells; spores rounded-oblong, trilete, spinulose.

TYPE SPECIES: *Ctenitis distans* (Brack.) Ching, based on *Lastrea distans* Brack., of Brazil. This is the same species named *Aspidium ctenitis* by Link in 1833, but this earlier specific epithet cannot be used under *Ctenitis* as a generic name.

A pantropical genus of more than 100 species, about two-thirds of them in the American tropics. In the Lesser Antilles seven species have been found, three of these endemic.

KEY TO THE SPECIES

a. Rhizome creeping, the fronds scattered; blade pentagonal in outline .... 1. *C. protensa*
a. Rhizome erect, the fronds clustered; blade not pentagonal.
  b. Blades 1-pinnate-pinnatifid except at extreme base; rhizome scales mostly 6–11 mm. long, denticulate .... 2. *C. macrotheca*
  b. Blades 2-pinnate-pinnatifid to 4-pinnate; rhizome scales normally more than 15 mm. long.

c. Indusium large, reddish-brown, and persistent; blade very large, conspicuously villous . . . . 4. *C. villosa*

c. Indusium absent or very small and quickly deciduous; blade not villous.
  d. Scales of rhizome and blade denticulate . . . . 3. *C. subincisa*
  d. Scales of rhizome and blade entire.
    e. Secondary frond divisions adnate to the costa on their basiscopic side; rhizome scales dull brown; tissue usually glabrous on both sides . . . . 5. *C. meridionalis*
    e. Secondary frond divisions free on both sides; rhizome scales bright reddish- or yellowish-brown; tissue minutely pubescent beneath.
      f. Scales of costules lanceolate, flat, pale brown, not clathrate . . . . 6. *C. sloanei*
      f. Scales of costules ovate-acuminate, bullate, blackish-brown, clathrate . . . . 7. *C. excelsa*

1. **Ctenitis protensa** (Afz. ex Sw.) Ching in Sunyatsenia **5**: 250. 1940. var. **funesta** (Kunze) Proctor in Rhodora **63**: 34. 1961.

Basionym: *Aspidium funestum* Kunze in Linnaea **9**: 96. 1834.
Type: *Poeppig*, from Ega (= Tefe or Teffe), Brazil.
Syn.: *Nephrodium funestum* (Kunze) Hook., Sp. Fil. **4**: 129, *t. 259*. 1860.
Aspidium subquinquefidum sensu Duss, Foug. & Lyc. Antill. Franc. 102. 1903, not Beauv., 1804.
Dryopteris protensa var. *funesta* (Kunze) C. Chr. in Dansk. Vid. Selsk. Skr. VIII, **6**: 91. 1920.
Thelypteris funesta (Kunze) Alston in Kew Bull. **1932**: 309. 1932.

Rhizome 3–5 mm. thick, bearing bright brown, glabrous lance-attenuate scales, 2–3 mm. long; stipes mostly 15–65 cm. long, puberulous, deciduously scaly, the scales linear-attenuate, sparsely ciliolate. Blades deltate-pentagonal, 20–35 cm. long, nearly as broad, 3-pinnate at base (due to the elongate lower basal pinnules of the basal pinnae), 2-pinnate to pinnate-pinnatifid above; principal axes rusty-puberulous above, and all vascular parts rusty-puberulous beneath, the hairs uniformly small and pluricellular; segments rounded, crenate or nearly entire, the tissue glabrous throughout. Sori small, indusiate; indusia persistent, pubescent with short pluricellular hairs.

General Distribution: Hispaniola (?), Trinidad, continental tropical America from Nicaragua to the Guianas and Brazil.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Wet forest floor at low elevations.

The typical variety of this species is chiefly African (type from Sierra Leone).

2. **Ctenitis macrotheca** (Fée) Ching in Sunyatsenia **5**: 250. 1940.

Basionym: *Phegopteris macrotheca* Fée, Mém. Fam. Foug. **11**: 56. 1866.
Type: *L'Herminier in 1864*, from Guadeloupe.

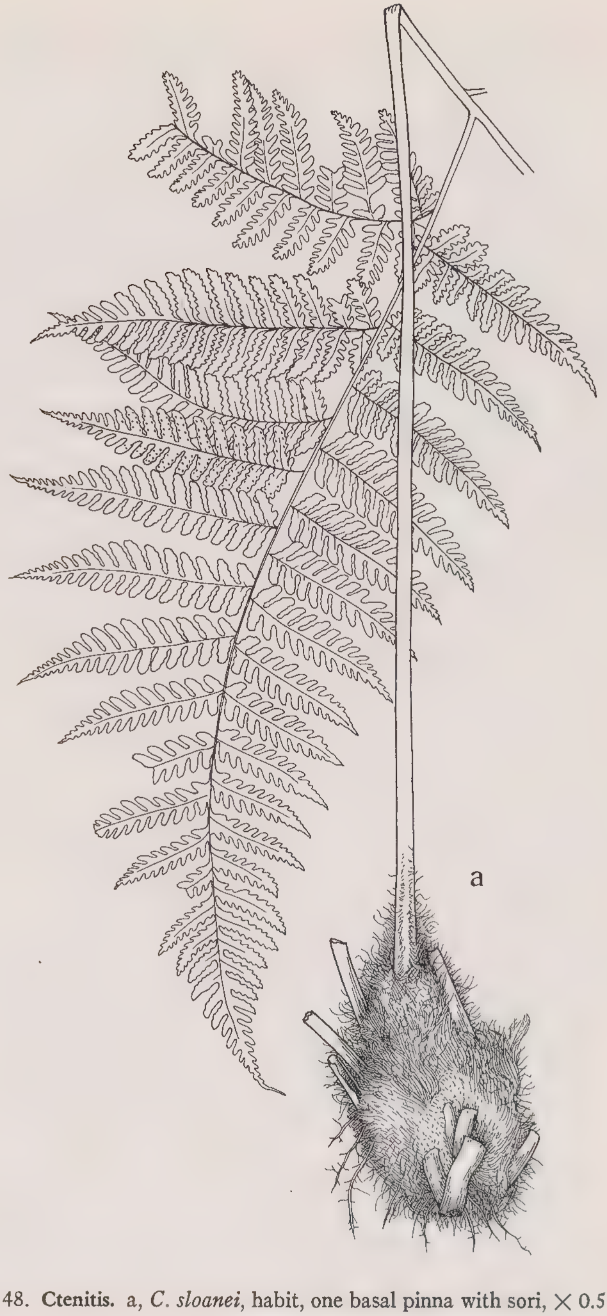

FIGURE 48. **Ctenitis.** a, *C. sloanei*, habit, one basal pinna with sori, × 0.5.

Syn.: *Aspidium spectabile* sensu Husnot, Cat. Crypt. Antill. Franc. 41. 1870, not Blume, 1828.
Polypodium mazei Baker in Ann. Bot. **5**: 457. 1891. (Type from Guadeloupe.)
Polypodium connexum var. *mazei* (Baker) Fourn. ex Duss, Foug. & Lyc. Antill. Franc. 56. 1903.
Dryopteris mazei (Baker) C. Chr., Ind. Fil. 277. 1905.
Dryopteris macrotheca (Fée) C. Chr., Ind. Fil. Suppl. 35. 1913.

Rhizome erect, woody, bearing at apex numerous linear-attenuate, subclathrate, somewhat iridescent scales, these ca. 1 mm. broad. Fronds up to 85 cm. long or more; stipes brown or purple-brown, about one-third as long as the blades, bearing numerous scales similar to those of the rhizome, but shorter and with fewer or no marginal teeth. Blades narrowly deltate or deltate-ovate (widest at or near base), up to 35 cm. broad; rhachis, costae, and costules bearing numerous linear-attenuate, entire scales; lowest pinnae fully pinnate on basiscopic side, the pinnules deeply lobed to pinnatifid; remainder of pinnae equilateral, narrowly oblong, to 6.5 cm. broad, sessile, acuminate; segments linear-oblong, mostly 5–9 mm. broad, rounded and often subfalcate at the apex, the margins entire to broadly crenate or shallowly lobed, separated by broad sinuses; tissue thin-herbaceous, glabrous, the veins simple or forked, the enlarged tips not reaching the margins. Sori medial, lacking indusia.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Moist shaded gullies at 1000 m. elevation or higher, especially in the area of Grande Decouverte; this species not uncommon in the limited areas where it occurs.

Hispaniola specimens cited by Christensen as *Dryopteris* (*Ctenitis*) *macrotheca* represent an undescribed species.

3. **Ctenitis subincisa** (Willd.) Ching in Sunyatsenia **5**: 250. 1940.

Basionym: *Polypodium subincisum* Willd. in L., Sp. Pl. **5**: 202. 1810.
Type: *Bredemeyer, Herb. Willd. 19701*, from Caracas, Venezuela (B).
Syn.: *Polypodium caribaeum* Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 319. 1811.
Alsophila martinicensis Sprengel in Neue Entd. **3**: 7. 1822. (Type from Martinique.)
Phegopteris subincisa (Willd.) Fée, Mém. Fam. Foug. **5**: 243. 1852.
Aspidium villosum sensu Griseb., Fl. Br. W. Ind. 690. 1864, in part, not Sw., 1801.
Phegopteris dilatata Fée, Mém. Fam. Foug. **11**: 52, *t. 14, fig. 1.* 1866. (Type from Guadeloupe.)
Nephrodium villosum var. *subincisum* (Willd.) Jenman in Bull. Bot. Dept. Jamaica II, **3**: 114. 1896.
Polypodium connexum sensu Duss, Foug. & Lyc. Antill. Franc. 56. 1903, not Kaulf., 1824.

Dryopteris subincisa (Willd.) Urban, Symb. Antill. 4: 19. 1903.
Aspidium subincisum (Willd.) Christ in Bull. Herb. Boiss. II, 6: 56. 1906.

For further extensive synonymy, see C. Chr. in Dansk. Vid. Selsk. Skr. VIII, 6: 65. 1920; also Domin, Pter. Dominica 225, 226. 1929.

Rhizome stout, erect, densely scaly at the apex, the scales golden-brown, narrowly lance-attenuate, up to 30 mm. long, ca. 1 mm. broad near the base, the margins finely denticulate. Fronds erect-spreading, up to 2.5 m. long (often much smaller); stipes densely scaly, much shorter than the blades. Blades deltate-ovate, 3-pinnate-pinnatifid at base, 2-pinnate-pinnatifid above; rhachis deciduously fibrillose-scaly; basal pinnae the largest, stalked, unequally deltate, 30–90 cm. long; middle pinnae narrowly oblong-acuminate; pinnules 6–10 cm. long, the upper ones adnate-decurrent; segments close, oblong, 3–5 mm. broad, subfalcate, entire, the margins ciliate; tissue thinly herbaceous, sparingly pubescent (as are the costae, costules, and veins), the veins simple or forked, not reaching the margins. Sori small, medial, without indusia.

General Distribution: Greater Antilles, continental tropical America from Mexico to Paraguay.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Rain forest areas, especially in moist ravines and gullies, at middle to higher elevations.

4. **Ctenitis villosa** (L.) Copel., Gen. Fil. 125. 1947.

Basionym: *Polypodium villosum* L., Sp. Pl. 2: 1093. 1753.
Lectotype: Plumier, Descr. Pl. Amer. *t. 23* (= Tr. Foug. *t. 27*), based on material from vicinity of Port de Paix and "le Tapion du Petit Goive," Haiti. Linnaeus also cited "*Sloan. jam. 23. hist.* 1. p. 100," but Sloane's specimen (which I have examined) is the plant now called *Anisosorus hirsutus*, and this reference must therefore be excluded from the synonymy of *Ctenitis villosa*. Linnaeus likewise cited Petiver "*fil. 52. t. 4. f. 10*" (should be *f. 9*), but this illustration, like many by the same author, is merely copied from Plumier.
Syn.: *Aspidium villosum* (L.) Sw. in J. Bot. Schrader 1800(2): 39. 1801.
Nephrodium villosum (L.) C. Presl, Rel. Haenk. 1: 38. 1825.
Lastrea villosa (L.) C. Presl, Tent. Pter. 76. 1836.
Dryopteris villosa (L.) Kuntze, Rev. Gen. Pl. 2: 814. 1891.

Rhizome erect, massive, subwoody, up to 15 cm. thick or more, in mature plants rising to 30 cm. or more above ground level, densely clothed (together with lower part of stipes) with dark brown, lance-linear, finely denticulate scales, these up to 25 mm. long and 2 mm. broad near base. Fronds arching, up to 4 m. long or more; stipes stout, hollow-septate, shorter than the blades, and grooved on upper (adaxial) side. Blades deltate, to 2.5 m. long or more, nearly as broad, 3-pinnate-pinnatifid (rarely 4-pinnate-pinnatifid) at base, usually 2-pinnate-pinnatifid above; rhachis deciduously scaly, at length naked; basal pinnae the largest, 1 m. long or more, unequally deltate (the basiscopic secondary divisions greatly elongate); middle pinnae narrowly oblong, sessile, acuminate; pinnules 6–12 cm. long, the upper ones adnate-decurrent; segments oblong 3–6 mm. broad, subfalcate, subentire to crenate or falcate-lobed, the margins ciliate, the veins simple or forked, with enlarged tips not reaching the margins. Indusium glabrous.

General Distribution: Cuba, Jamaica, Hispaniola.

Distribution in Lesser Antilles: Dominica, *Hodge 2836* (gh).

Habitat: Moist ravines in rain forest areas at middle elevations; plants very rare.

5. **Ctenitis meridionalis** (Poiret) Ching in Sunyatsenia **5**: 250. 1940.

Basionym: *Polypodium meridionale* Poiret in Lam., Encycl. Méth. Bot. **5**: 553. 1804.

Type: *Badier*, from Guadeloupe (holotype, *Herb. Lamarck* (p), isotype, *Herb. Willd. 19807* (b).)

Syn.: *Aspidium frondosum* Wikstr. in Kongl. Sv. Vet. Akad. Handl. **1825**: 437. 1826.

Aspidium consobrinum Fée, Mém. Fam. Foug. **11**: 85. 1866. (Type from Guadeloupe.)

Aspidium nemorosum sensu Jenman in Gard. Chron. III, **37**: 134. 1894, not Willd. in L., 1810.

Nephrodium berkeleyi Jenman in herb., ined.

Nephrodium nemorosum sensu Jenman, Ferns Br. W. Ind. & Guiana 223. 1908, not Desvaux, 1827.

Dryopteris meridionalis (Poiret) C. Chr. in Dansk. Vid. Selsk. Skr. VIII, **6**: 46. 1920.

Rhizome erect, woody, clothed at apex with a soft, dense mass of dull reddish-brown, linear-filiform, contorted scales, these mostly 15–20 mm. long (similar scales also on lower part of stipe). Fronds mostly 1–1.3 m. long; stipes brownish, grooved, about one-third to two-thirds as long as the blades. Blades broadly ovate, to 60 cm. broad, 2-pinnate-pinnatifid; rhachis minutely brownish-puberulous in grooves and bearing scattered hairlike bicolorous scales; lowest pinnae inequilateral, the basiscopic pinnules longer than the acroscopic ones; middle pinnae narrowly oblong, nearly sessile, acuminate; pinnules mostly 3–3.5 cm. long; segments crenate to falcately lobed, the margins nearly glabrous, the veins simple or forked, with tips not reaching the margins. Indusium thin, reddish-translucent, with glandular-erose margins.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Martinique, Grenada (?).

HABITAT: Damp wooded hillsides and moist stream banks at lower to middle elevations.

6. **Ctenitis sloanei** (Poeppig ex Sprengel) Morton in Amer. Fern J. **59**: 66. 1969.

Basionym: *Polypodium sloanei* Poeppig ex Sprengel in L., Syst. Nat. ed. 16, **4**: 59. 1827.

Type: *Poeppig s.n.*, from near Cahoba, Cuba, as cited by Morton (L, isotype).

Syn.: *Ctenitis ampla* of many authors, not *Polypodium amplum* Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 207. 1810.

Rhizome erect, woody, to 3 cm. thick or more, clothed (along with stipe bases) with a dense, soft mass of woolly, delicate golden-brown scales, these contorted-linear, up to 40 mm. long or more, and mostly less than 1 mm. broad. Fronds arching-spreading, up to 1.5 m. long (rarely more), the shallowly grooved stipes about half as long as the blades. Blades deltate, up to 1 m. long (often much smaller) and to 80 cm. broad, 3-pinnate-pinnatifid at base, 2-pinnate-pinnatifid above; rhachis finely scaly; pinnae in about 12 pairs; basal pinnae unequally deltate, the lower basiscopic pinnules longer than the corresponding acroscopic ones and more divided; middle pinnae narrowly oblong, short-stalked, acuminate, 6–9 cm. broad; ultimate segments oblong, obtuse, crenulate to lobed; tissue pale green in life, the veins simple to 2-forked, the tips extending to the minutely ciliate margins. Sori very small; indusium minute and glandular-ciliate, or else apparently lacking.

GENERAL DISTRIBUTION: Florida, Greater Antilles except Puerto Rico; Tobago, Trinidad, Central America, northern South America, Galapagos Islands.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent, Grenada.

HABITAT: Wooded hillsides at middle elevations.

C. sloanei has been widely misinterpreted by various authors in the past, as first pointed out by Christensen in 1920, and further clarified by Morton in 1969.

7. **Ctenitis excelsa** (Desvaux) Proctor in Rhodora **63**: 34. 1961.

Basionym: *Polypodium excelsum* Desvaux in Mém. Soc. Linn. Paris **6**: 243. 1827.

Type: Without specified collector, ex *Herb. Desvaux*, found "in Antillis" (B, P).

Syn.: *Phegopteris inaequalis* sensu Husnot, Cat. Crypt. Antill. Franc. 44. 1870, not Fée, 1857.

Aspidium amplum sensu Duss, Foug. & Lyc. Antill. Franc. 103. 1903, not Mettenius, 1858.

Dryopteris excelsa (Desvaux) C. Chr., Ind. Fil. 264. 1905, excl. syn.

Rhizome erect, woody, to 3 cm. thick or more, bearing a mass of soft scales resembling those of *C. ampla* but usually somewhat redder and not so long. Fronds arching, up to 2 m. long; stipes much shorter than the blades and (together with the rhachis and costae) bearing small, blackish-clathrate, iridescent scales. Blades deltate, up to 1.5 m. long and 1 m. broad, 4-pinnate-pinnatifid at base (the lowest basiscopic secondary divisions markedly elongate), less divided above, similar in dissection to *C. ampla* but the middle pinnae more inequilateral, with veins simple or 1-forked, the tips extending to the glabrous margins. Sori small; indusium apparently lacking.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: Wooded, more or less rocky (noncalcareous) hillsides at middle elevations; plants not common.

LASTREOPSIS Ching

Lastreopsis Ching in Bull. Fan Mem. Inst. Biol., Bot. Ser. **8**: 157. 1938.
Figure 49.

Medium-sized to rather large terrestrial ferns. Rhizomes creeping to erect, clothed with scales. Fronds arching, long stipitate; stipes with 2 prominent ridges on upper (adaxial) side. Blades decompound, more or less deltate, catadromous, usually bearing a scaly proliferous bud on the rhachis below the apex; rhachis bordered by 2 prominent ridges on the upper (adaxial) side, these continuous with the thickened lower margins of the ultimate segments, the groove between them clothed with articulate, pluricellular, unbranched hairs; tertiary rhachises convex on upper side; ultimate segments usually acute or mucronate to apiculate, the veins all free, usually reaching the margins. Sori small, round, usually with an orbicular-reniform indusium, or else indusium lacking. Sporangia glabrous with glandular stalk; annulus of 12–18 cells; spores bilateral, monolete, with more or less crested or verrucose perispore.

Type species: *Lastreopsis recedens* (J. Smith ex T. Moore) Ching, a synonym of *L. tenera* (R. Br.) Tindale, of wide distribution in the Oriental tropics.

A pantropical genus of 33 or more species; one species is recorded from the Lesser Antilles.

Special literature: Tindale, A monograph of the genus *Lastreopsis* Ching, in Contr. New S. Wales Nat. Herb. 3: 249–339, *t. 9–23, 3 maps*. 1965.

1. **Lastreopsis effusa** (Sw.) Tindale in Vict. Nat. **73**: 184. 1957.

Basionym: *Polypodium effusum* Sw., Prodr. 134. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Polypodium multifidum* Jacq., Coll. Bot. 3: 187. 1789.
Phegopteris effusa (Sw.) Fée, Mém. Fam. Foug. 5: 243. 1852.

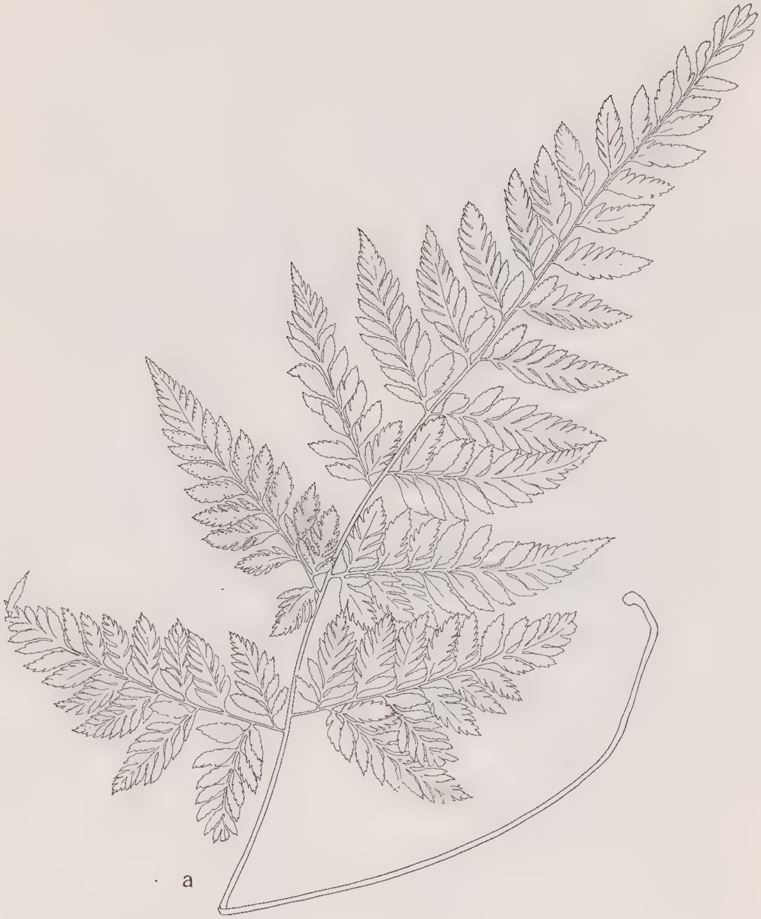

FIGURE 49. **Lastreopsis.** a, *L. effusa*, frond, one small frond with sori, × 0.4.

Aspidium effusum (Sw.) Griseb., Fl. Br. W. Ind. 690. 1864.
Nephrodium effusum (Sw.) Baker in Hook. & Baker, Syn. Fil. 287. 1867.
Polystichum effusum (Sw.) Keys., Pol. Cyath. Herb. Bung. 45. 1873.
Dryopteris effusa (Sw.) Urban, Symb. Antill. **4**: 16. 1903.
Parapolystichum effusum (Sw.) Ching in Sunyatsenia **5**: 239. 1940.
Ctenitis effusa (Sw.) Copel., Gen. Fil. 124. 1947.

Rhizome short-creeping, woody, to 2 cm. thick, clothed with thin, reddish-brown scales. Fronds erect-arching, to 2 m. long; stipes stout, stramineous, as long as the blades. Blades deltate, acuminate, to 1 m. long and nearly as broad, 2-pinnate-pinnatifid to 4-pinnate-pinnatifid, nearly glabrous except for the groove on upper side of the rhachis; basal pinnae the largest, stalked, deltate, inequilateral (basal pinnules on basiscopic side elongate); ultimate divisions oblong or ovate-oblong, acuminate, serrate or serrate-lobed, decurrent on the winged costules; tissue beneath bearing minute, appressed, reddish glandular hairs (or at least a few of these on the veins). Sori numerous, small, subterminal on veins; indusium lacking.

Two varieties of this rather polymorphic species have been recorded from the Lesser Antilles. These can be distinguished as follows:

a. Fronds mostly 4-pinnate to almost 5-pinnate, the secondary pinnules without a broad uncut central part; tissue with numerous minute, glandular hairs on the lower surface; vascular parts glabrous beneath . . 1a. var. *effusa*
a. Fronds mostly 3-pinnate, the secondary pinnules with a broad uncut central part; tissue without glandular hairs beneath except sometimes a few on the veins; vascular parts short-pubescent beneath . . . . . 1b. var. *divergens*

1a. **Lastreopsis effusa** var. **effusa**

General Distribution: Greater Antilles, continental tropical America from Mexico to Ecuador.

Distribution in Lesser Antilles: Martinique, *Plée* (p); St. Vincent, *H. H. & G. W. Smith 862* (ij).

Habitat: Wooded rocky banks and hillsides at middle elevations; plants very rare.

1b. **Lastreopsis effusa** subsp. **divergens** (Willd. ex Schkuhr) Tindale in Contr. New S. Wales Nat. Herb. 3: 299. 1965.

Basionym: *Polypodium divergens* Willd. ex Schkuhr, Krypt. Gew. **1**: 27, *t. 26b.* 1806.
Type: *Bredemeyer, Herb. Willd. 19725*, from Caracas, Venezuela (b).
Syn.: *Dryopteris effusa* var. *divergens* (Willd. ex Schkuhr) Hieron. in Engl. Bot. Jahrb. **34**: 447. 1905.
Ctenitis effusa var. *divergens* (Willd. ex Schkuhr) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 18. 1953.

Rhizome scales to 9 mm. long, brown, opaque, lance-deltate, glabrous or very sparingly ciliate, occasionally toothed; tissue of blades firm, dull grayish-green.

General Distribution: Greater Antilles except Puerto Rico; Trinidad, continental tropical America from Guatemala to Paraguay and Brazil.

Distribution in Lesser Antilles: Martinique, St. Vincent, Grenada.

Habitat: Wooded hillsides and gullies; plants not common.

POLYSTICHOPSIS (John Smith) Holttum

Polystichopsis (J. Smith) Holttum in J. Linn. Soc. London, Bot. 53: 149, 152. 1947. Figure 50.

Basionym: *Lastrea* sect. *Polystichopsis* J. Smith, Hist. Fil. 217. 1875.
Syn.: *Dryopteris* subg. *Polystichopsis* (J. Smith) C. Chr. in Dansk. Vid. Selsk. Skr. VIII, 6: 101. 1920.

Rather small terrestrial ferns. Rhizomes short- to long-creeping, bearing nonclathrate, subentire scales. Fronds long-stipitate. Blades more or less deltate or ovate in outline, mostly 2-pinnate to 3-pinnate, anadromous throughout (or catadromous at base only); rhachis grooved above, the groove open to and continuous with grooves of the costae, usually hairy, the hairs pluricellular; ultimate divisions acute to mucronate at the apex, decurrent at the inequilateral base, glabrous or pubescent, often bearing minute capitate glands, the veins all free, not reaching the margins. Sporangia glabrous, nonglandular; spores bilateral, more or less rugose.

Type species: *Polystichopsis pubescens* (L.) Morton, based on *Polypodium pubescens* L. of the Greater Antilles.

A small genus of six known species, all but one confined to the West Indies; a single species occurs in the Lesser Antilles.

1. **Polystichopsis muscosa** (Vahl) Proctor in Amer. Fern J. 51: 146. 1961.

Basionym: *Polypodium muscosum* Vahl, Eclog. Amer. 3: 54. 1807.
Type: *Ryan*, from Montserrat.
Syn.: *Aspidium muscosum* (Vahl) Sw., Adnot. Bot. 68. 1829.
Phegopteris villosa Fée, Mém. Fam. Foug. 11: 53. 1866. (Type from Guadeloupe.)
Dryopteris pubescens var. *muscosa* (Vahl) C. Chr. in Dansk. Vid. Selsk. Skr. VIII, 6: 105. 1920.

Rhizome short-creeping, subwoody, 2–5 mm. thick, clothed with dark brown, opaque, lance-attenuate scales. Fronds closely distichous, spreading, 30–65 cm. long; stipes equalling or longer than the blades, more or less densely villous-pubescent (at least near the base) with soft white pluricellular hairs up to 3 mm. long. Blades deltate or ovate-deltate, 2-

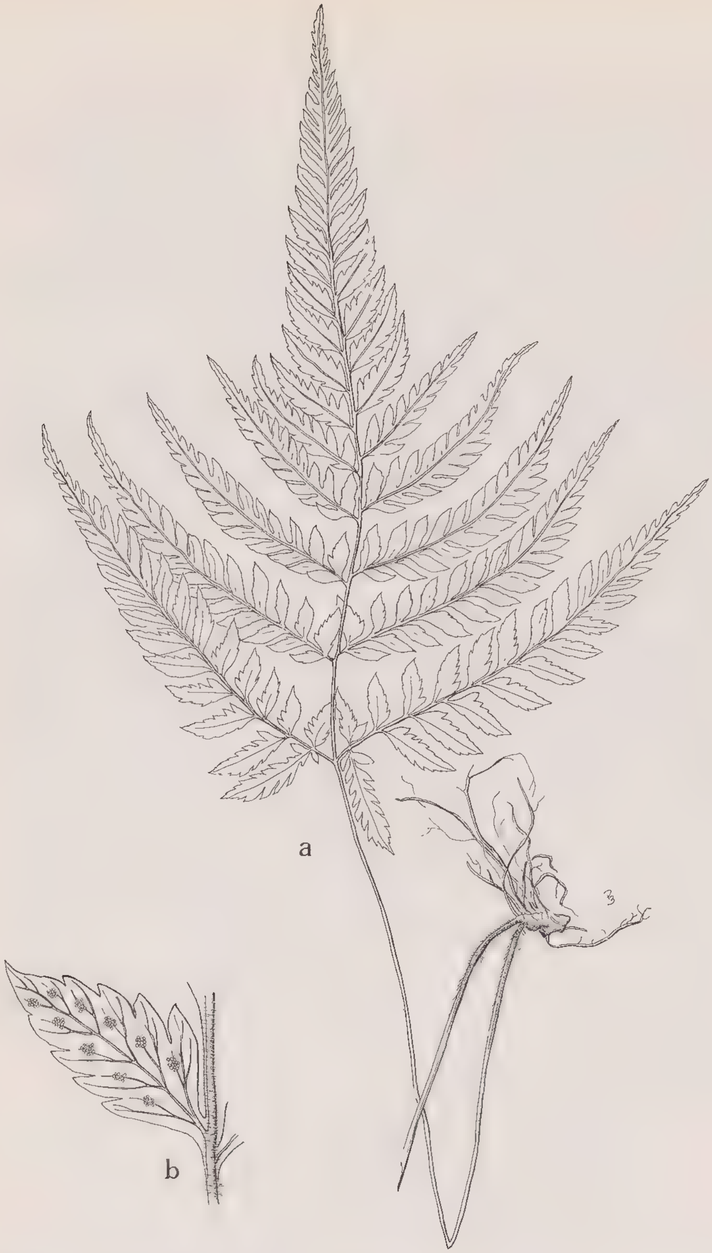

FIGURE 50. **Polystichopsis.** a, b, *P. muscosa*: a, habit, × 0.5; b, section of pinna showing venation and sporangia, × 2.5.

to 3-pinnate, long-acuminate at the apex; rhachis and other vascular parts whitish-villous like the stipe, also bearing scattered minute capitate glands beneath; lowest pinnae the largest, narrowly deltate, inequilateral, the lowest inferior pinnules either not elongate (in small fronds) or elongate and pinnately subdivided (in large fronds); ultimate divisions lance-oblong, sharply acute at apex, inequilateral and decurrent at base, the veins mostly forked. Sori subterminal on superior vein branches; indusium either lacking or minute, erect and fimbriate.

General Distribution: Trinidad (?), Margarita Island.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Martinique, St. Lucia.

Habitat: On moist shaded ledges or in humus on wooded hillsides at medium elevations.

The Guadeloupe population described as *Phegopteris villosa* Fée differs from typical *Polystichopsis muscosa* not only in its smaller size and more delicate texture, but also in the length and distribution of the hairs, and by having a minute indusium. It should probably be recognized as at least varietally distinct from *P. muscosa.* However, at this writing not enough is known about these forms and their relationships to warrant separating them. Future collectors should watch for these plants.

POLYSTICHUM Roth

Polystichum Roth in Röm. Arch. Bot. 2(1): 106. 1799. Figure 51.

Terrestrial ferns of moderate size. Rhizomes woody, erect or decumbent, densely scaly at the apex. Fronds erect or arching; stipes usually scaly, not articulate to the rhizome. Blades 1-pinnate (in Lesser Antillean species), more or less scaly but lacking hairs, often proliferous by means of scaly buds at or below the apex; ultimate divisions more or less serrate and mucronate (often spinulose), the veins free, often not quite reaching the margins. Sori round, dorsal to subterminal on veins; indusium orbicular and centrally peltate, persistent or deciduous. Sporangia with annulus of 18 cells or more; spores bilateral, usually echinulate or tuberculate.

Type species: *Polystichum aculeatum* (L.) Roth, based on *Polypodium aculeatum* L. of north-temperate regions.

A large genus of more than 175 species, cosmopolitan in overall distribution. Only two species occurs in the Lesser Antilles and both of these are very rare.

Key to the Species

a. Fronds spreading or prostrate, at least the fertile ones with a long taillike apex rooting at the tip; rhizome scales evenly reddish-brown, not bicolorous . . . . 1. *P. rhizophyllum*

a. Fronds erect or ascending, the apex neither taillike nor proliferous; rhizome scales bicolorous, dark brown with pale margins ...... 2. *P. guadalupense*

1. Polystichum rhizophyllum (Sw.) C. Presl, Tent. Pter. 82. 1836.

Basionym: *Polypodium rhizophyllum* Sw., Prodr. 132. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Aspidium rhizophyllum* (Sw.) Sw. in J. Bot. Schrader 1800(2): 31. 1801.
Polystichum krugii Maxon in Proc. Biol. Soc. Washington 18: 215. 1905. (Type from Puerto Rico.)

Rhizome very short, bearing numerous firm, ovate-oblong, dull reddish-brown scales. Fronds 10–25 cm. long, forming a rosette; stipes short (1–5 cm.), bearing small, pale-brown, narrowly attenuate entire scales. Blades linear to oblong-lanceolate, the lower part fully pinnate, 1–2 cm. broad, the upper part subentire and taillike, attenuate to an apex not more than 1 mm. broad; pinnae mostly 4–11 pairs, subdistant, obliquely ovate-oblong to obovate, obtuse, 5–12 mm. long, 3–8 mm. broad, subentire, with flabellate venation, and both surfaces thinly fibrillose-scaly. Sori mostly confined to the taillike apex; indusium large, soon falling.

General Distribution: Greater Antilles.

Distribution in Lesser Antilles: Guadeloupe, *Mazé s.n.* (B).

Habitat: In clay soil on rocky banks at low to middle elevations; plants rare.

2. Polystichum guadalupense Fée, Mém. Fam. Foug. 11: 74, *t. 19, fig. 2*. 1866.

Type: *L'Herminier in 1861*, from Guadeloupe (IJ, isotype).
Syn.: *Aspidium triangulum* sensu Duss, Foug. & Lyc. Antill Franc. 103. 1903, not *Polypodium triangulum* L., 1753.

Rhizome short, decumbent or ascending, 0.5–0.8 cm. thick, bearing stiff, lustrous, blackish-brown scales with pale margins. Fronds mostly 11–19 cm. long, of membranous, pellucid texture; stipes short (2–4.5 cm.), bearing scattered pale brown, lanceolate, ciliate scales. Blades lance-linear, mostly 2–3 cm. broad, acute at the apex; rhachis minutely fibrillose; pinnae mostly 12–17 pairs, close, rhombic-ovate to -oblong (the base very inequilateral), 10–15 mm. long, 5–9 mm. broad, obscurely auriculate on acroscopic side at base, more or less spinulose-denticulate, with veins mostly 1- to 2-forked, prominulous and all parts with very minute, scattered, stalked glands. Sori small, medial to submarginal; indusium not seen, perhaps lacking.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe.

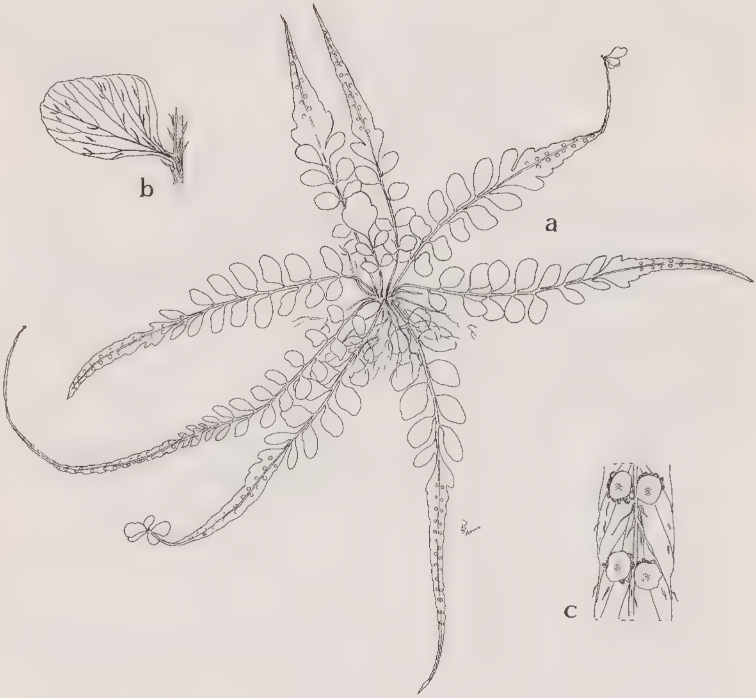

FIGURE 51. **Polystichum.** a–c, *P. rhizophyllum*: a, habit, two of the fronds rooting at the tips, × 0.4; b, pinna showing venation and fibrillose scales, × 1.8; c, section of fertile frond showing venation and sori, × 1.8.

HABITAT: Shaded rocky ravines near waterfalls, at middle elevations; plants very rare.

This species is closely related to *Polystichum echinatum* (J. Gmel.) C. Chr. of the Greater Antilles, differing especially in its smaller size, delicate texture, apparent absence of an indusium, and other details. More and better material is required in order to determine if *P. guadalupense* might better be considered a geographic variety of *P. echinatum*.

STIGMATOPTERIS C. Christensen

Stigmatopteris C. Chr. in Bot. Tidsskr. 29: 292. 1909. FIGURE 52.

Medium to rather large terrestrial ferns. Rhizomes decumbent, ascending or erect, clothed at apex with thin, brown, usually entire, glabrous scales. Fronds closely distichous or clustered, glabrous throughout; stipes grooved, clothed with scales. Blades pinnate to pinnate-pinnatifid, the pinnae always with long-acuminate, sharply serrate apex, the tissue punctate with "internal glands"; rhachis and costae grooved on upper (adaxial) side; costules pinnately branched, the veins usually all free (casually joined in a few species), terminating in intramarginal hydathodes. Sori dorsal or terminal on veinlets, with or without indusia; indusium (if present) peltate. Sporangia with articulate pedicels (the capsules deciduous); annulus of 12–16 cells; spores oblong-bilateral, the perispore spiny.

TYPE SPECIES: *Stigmatopteris rotundata* (Willd.) C. Chr., based on *Aspidium rotundatum* Willd. of the Lesser Antilles and South America.

A tropical American genus of about 26 species, only the type species being known from the Lesser Antilles. This taxon has by some authors been considered a subgenus of *Dryopteris*. However, true *Dryopteris* does not occur in the Lesser Antilles.

1. **Stigmatopteris rotundata** (Willd.) C. Chr. in Bot. Tidsskr. 29: 297, *fig. 2*. 1909.

Basionym: *Aspidium rotundatum* Willd. in L., Sp. Pl. 5: 247. 1810.
Type: Plumier, Tr. Foug. *t. 38*, based on material from near Cabsterre, Martinique.
Syn.: *Polypodium flavopunctatum* Kaulf., Enum. Fil. 108. 1824. (Type from Martinique.)
Nephrodium imrayanum Hook., Sp. Fil. 4: 86. 1862. (Type from Dominica.)
Phegopteris flavopunctata (Kaulf.) Fée, Mém. Fam. Foug. 11: 51. 1866.
Aspidium imrayanum (Hook.) Fée, Mém. Fam. Foug. 11: 79. 1866.
Dryopteris rotundata (Willd.) C. Chr., Ind. Fil. 289. 1905.
Dryopteris imrayana (Hook.) Domin, Pter. Dominica 191. 1929.

Rhizome short-creeping, woody, its scales lanceolate or lance-linear, attenuate, entire to sparsely denticulate. Fronds up to 2 m. long; stipes about one-third as long as the blades. Blades pinnate, oblong or oblong-

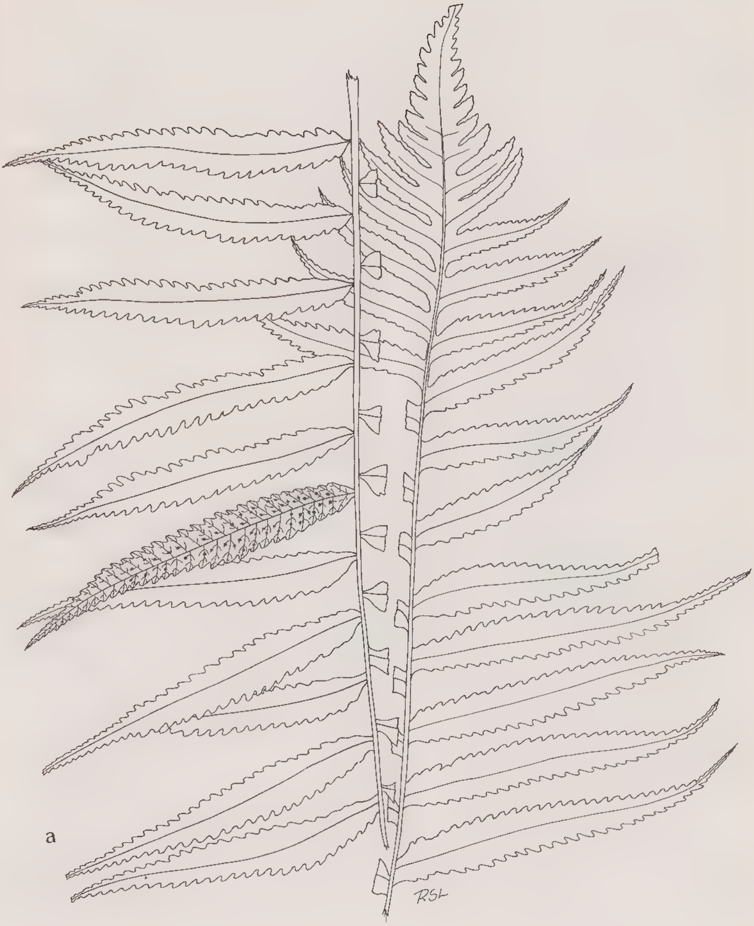

FIGURE 52. **Stigmatopteris.** a, sections of frond, one pinna with venation and sori, × 0.4.

lanceolate, 20–50 cm. broad, truncate at base, acuminate at the apex; rhachis and costae sparsely scaly, especially beneath; pinnae mostly 1.5–3 cm. broad, narrowly lance-attenuate or linear-attenuate; inequilateral at the base, the lower ones short-stalked, the upper ones becoming adnate especially on the basiscopic side, those near the apex decurrent and confluent, the margins obliquely lobed, the lobes more or less deltate-truncate to subfalcate, lightly crenate to entire, the tissue herbaceous. Sori mostly near the costa; indusium lacking.

General Distribution: Trinidad, Brazil.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist, shaded, rocky ravines near streams, at middle elevations.

DIPLAZIUM Swartz

Diplazium Sw. in J. Bot. Schrader 1800(2): 61. 1801. Figure 53.

Terrestrial ferns of small to large size. Rhizomes creeping, ascending to erect and sometimes massive, scaly at the apex, the scales usually not clathrate. Fronds stipitate; stipes not articulate, internally having a single U-shaped stele at the top (just below the blade), formed by two lunate bundles joined end to end. Blades simple to 4-pinnate; ultimate divisions small or large, of various textures but often rather succulent, the veins free, partly connivent or reticulate, or completely reticulate, the areoles without free included veinlets. Sori elliptic to elongate-linear, often partly or wholly doubled or paired along a single vein; indusia similar in shape to the sori, attached laterally, those of a pair opening back-to-back away from each other. Sporangia with annulus of 12–20 cells; spores bilateral-reniform.

Type species: *Diplazium plantagineum* (L.) Sw., now correctly known as *D. plantaginifolium* (L.) Urban, a plant of the American tropics. The combination made by Swartz was based on the Linnaean *Asplenium plantagineum* and is synonymous with *A. plantaginifolium* L. (the basionym of Urban's combination).

A large, pantropical genus of more than 350 species, of which 14 have been found in the Lesser Antilles. *Diplazium* has sometimes been united with *Athyrium*, a taxon best represented in temperate regions.

Key to the Species

a. Blades simple .... 1. *D. plantaginifolium*
a. Blades 1- to 2-pinnate.
  b. Pinnae nearly entire to crenate or crenate-serrate (not distinctly lobed, except at base in *D. unilobum*).

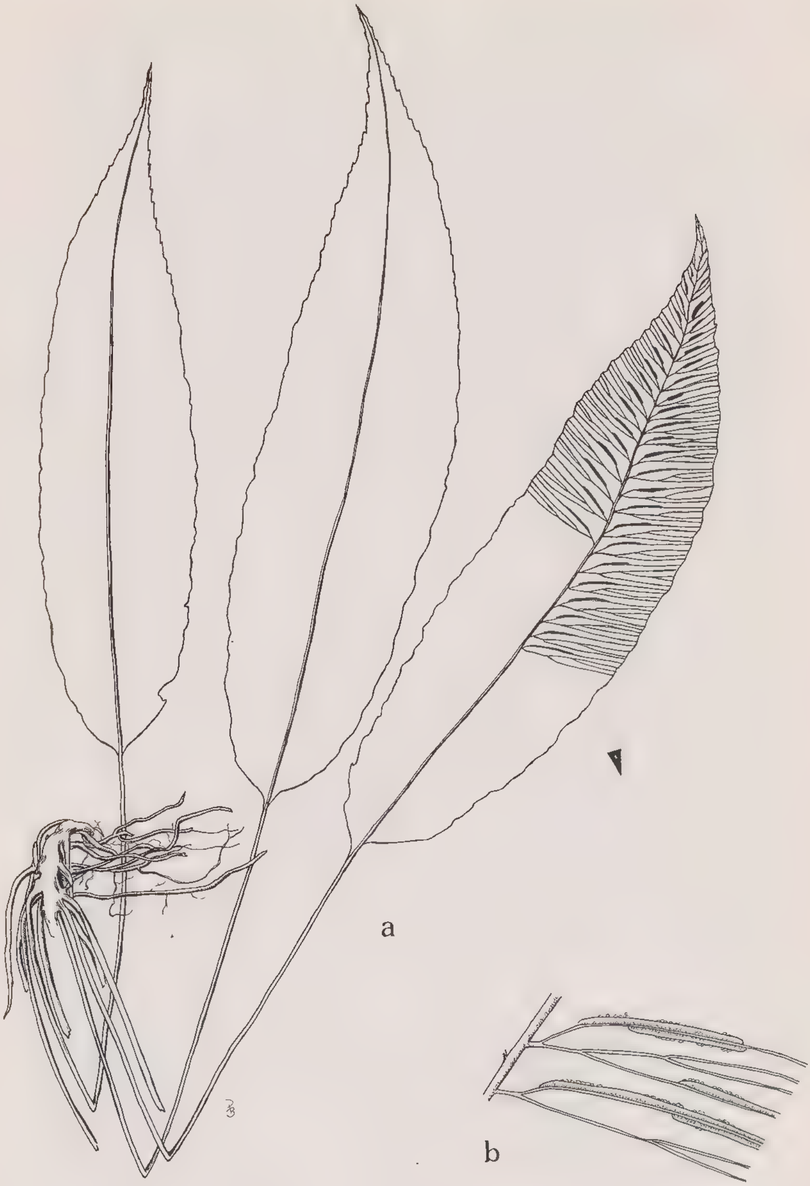

FIGURE 53. **Diplazium.** a, b, *D. plantaginifolium*: a, habit, × 0.5; b, enlarged portion of blade showing venation and sporangia, × 2.0.

c. Veins all free.

  d. Blades with a free terminal pinna similar to the lateral ones (or the terminal pinna at most 1-lobed at base) .... 2. *D. flavescens*

  d. Blades with a pinnatifid apex.

    e. Pinnae inequilateral at base, often with one lobe at base on acroscopic side (rarely this lobe free); blades 5–15 cm. broad .... 3. *D. unilobum*

    e. Pinnae nearly equilateral at base, nearly always unlobed (rarely broadly truncate-lobed in *D. legalloi*); blades 15–50 cm. broad.

      f. Rhachis fibrillose-scaly; indusium pale brown, fimbriate .. .. 4. *D. centripetale*

      f. Rhachis naked; indusium dark brown, not fimbriate.

        g. Pinnae 10–15 on a side, 2–4 cm. broad; sori not over 1.5 cm. long .... 5. *D. grandifolium*

        g. Pinnae 6–10 on a side, 5–10 cm. broad; sori up to 3 cm. long .... 6. *D. legalloi*

c. Veins becoming reticulate toward the margins.

  h. Rhachis, costae, and veins beneath bearing small lacerate-denticulate scales; sori not parallel; rhizome scales denticulate .... 7. *D. godmanii*

  h. Rhachis, costae, and veins naked; sori parallel; rhizome scales entire .... 8. *D. limbatum*

b. Pinnae crenately lobed to fully pinnate.

  i. Pinnae lobed to pinnatifid, not fully pinnate.

    j. Pinnae strongly inequilateral at base; sori primarily in a single row on either side of the costa (if others in the lobes, these much shorter); blades more or less deltate, widest at base .... 9. *D. cristatum*

    j. Pinnae essentially equilateral at base; sori primarily located in the segments or lobes and mostly all similar in length; blades of an oblong type, widest near the middle.

      k. Costae and costules nearly or quite lacking scales beneath.

        l. Segments 2–5 mm. broad, the basal veins of fertile ones usually lacking sori .... 10. *D. caracasanum*

        l. Segments 6–15 mm. broad (sometimes more), at least the basal veins (and usually all) of fertile ones bearing sori.

          m. Veins all simple; margins of segments entire or nearly so; fronds dark green, of heavy texture .... 11. *D. apollinaris*

          m. At least some veins 1- or 2-forked; margins of segments distantly crenulate-serrulate; fronds light green, of relatively thin texture .... 12. *D. striatum*

      k. Costae and costules bearing numerous minute scales beneath; rhizome scales denticulate .... 13. *D. l'herminieri*

  i. Pinnae fully pinnate.

    n. Blades glabrous, the vascular parts minutely scaly beneath; rhizome scales denticulate .... 13. *D. l'herminieri*

    n. Blades finely hirtellous throughout beneath, but minute scales few or lacking; rhizome scales entire .... 14. *D. expansum*

1. **Diplazium plantaginifolium** (L.) Urban, Symb. Antill. 4: 31. 1903.

Basionym: *Asplenium plantaginifolium* L., Syst. Nat. ed. 10, 2: 1323. 1759.
Type: *P. Browne*, from Jamaica.
Syn.: *Asplenium plantagineum* L., Sp. Pl. ed. 2, 2: 1537. 1763.
Diplazium plantagineum (L.) Sw. in J. Bot. Schrader **1800**(2): 62. 1801.

Rhizome ascending to erect, 1–2 cm. thick, with copious thick, wiry roots, and clothed at apex with short, rigid, blackish scales. Fronds 30–60 cm. long; stipes as long as the blades or longer, glabrous. Blades oblong-lanceolate to lance-linear, 3.5–7 cm. broad, broadly cuneate or roundish-truncate at base, acuminate-cuspidate at apex, the margins subentire or sinuate-dentate in the lower half, crenate-serrate to deeply serrate above; tissue papery, dark green, glabrous, the veins pinnately branched, all the branches reaching the margin; rhachis often viviparous at base. Sori to 3 cm. long.

General Distribution: Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: Wet, rocky forest slopes at middle elevations.

2. **Diplazium flavescens** (Mettenius) Christ, Farnkr. 217. 1897.

Basionym: *Asplenium flavescens* Mettenius in Ann. Sci. Nat. Bot. V, 2: 234. 1864.
Type: A specimen cultivated at the Royal Botanic Gardens, Kew, originally from Venezuela (*Wagener*); paratype also from Venezuela (*Fendler 498*).
Syn.: *Diplazium juglandifolium* Hook., Fil. Exot. *t. 100.* 1859, not *Asplenium juglandifolium* Lam., 1786 (= *Diplazium juglandifolium* (Lam.) Sw., 1806; see synonymy of *Polybotrya cervina*, p. 223).

Rhizome erect to ascending, woody, clothed at apex with stiff, lance-attenuate, blackish-brown, subclathrate scales. Fronds 60–100 cm. long; stipes nearly as long as the blades, grooved, scaly toward base. Blades oblong to ovate-oblong, 20–35 cm. broad, truncate at base, slightly narrowed to the simple apical pinna; rhachis grooved on upper (adaxial) side; pinnae 6–9 pairs, 3–4.5 cm. broad, lanceolate or oblong-lanceolate, cuneate at base, acuminate-falcate at apex, the margins crenate-serrate, the veins 1- to 2-forked. Sori usually on first distal vein branch, up to 1.5 cm. long (2 cm. in apical pinna); indusium narrow with red-brown, entire margin.

General Distribution: Greater Antilles except Puerto Rico; continental tropical America from Mexico to Peru and Venezuela.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Wooded rocky hillsides at middle elevations; plants very rare.

3. **Diplazium unilobum** (Poiret) Hieron. in Hedwigia **59**: 332. 1917.

Basionym: *Asplenium unilobum* Poiret in Lam., Encycl. Méth. Bot. Suppl. **2**: 505. 1811.

Type: Nectoux, from Santo Domingo (FI) (as reported by Morton in Contr. U. S. Nat. Herb. **38**: 229. 1973).

Syn.: *? Asplenium arboreum* sensu Duss, Foug. & Lyc. Antill. Franc. 85. 1903, not Willd. in L., 1810.

Rhizome erect or curved-ascending, up to 1.5 cm. thick, tufted at apex with brown, lance-attenuate scales. Fronds few, stiffly spreading, 25–70 cm. long; stipes somewhat shorter than the blades, brownish-scaly near base. Blades oblong to oblong-lanceolate, 5–15 cm. broad, acuminate at the pinnatifid apex; pinnae 12–22 pairs, mostly alternate, oblique-spreading and subfalcate or blunt, more or less oblong-linear from a strongly inequilateral base, auricled or 1-lobed at base on the acroscopic side, the margins otherwise more or less crenate-dentate, the veins oblique, 1- to 3-forked, with ultimate branchlets ending in marginal cartilaginous teeth. Sori oblique, subarcuate, often paired, 3–5(–9) mm. long; indusium firm.

GENERAL DISTRIBUTION: Greater Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *L'Herminier* (P). Duss also cited his *4207* under the name *Asplenium arboreum*, but I have not seen his material. The occurrence of this species in the Lesser Antilles needs further confirmation.

HABITAT: Wooded hillsides and rocky thickets at middle elevations.

4. **Diplazium centripetale** (Baker) Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 441. 1926.

Basionym: *Asplenium centripetale* Baker in Hook. & Baker, Syn. Fil. ed. 2, 490. 1874.

Syntypes: *Macfayden* and *Purdie* from Jamaica, and *Belanger* from Martinique.

Syn.: *Asplenium celtidifolium* sensu Duss, Foug. & Lyc. Antill. Franc. 85. 1903, not Mettenius, 1856.

Rhizome erect, rather massive and up to 30 cm. long, bearing brown scales at the apex. Fronds 70–140 cm. long; stipes much shorter than the blades, succulent, densely clothed with long, spreading, light to dark brown, tortuous, attenuate scales. Blades oblong-lanceolate to oblong, 20–50 cm. broad, slightly narrowed at base, abruptly pinnatifid-acuminate at the apex; rhachis grooved, fibrillose-scaly when young; pinnae narrowly oblong to ligulate, subcordate-truncate or subauriculate at base, acute or short-acuminate at apex, the margins nearly entire to sinuate-crenate; costae bearing small, yellowish scales beneath, the veins pinnately branched. Sori in symmetric groups, the basal pair of each group the longest and about equal; indusium pale brown, fimbriate.

GENERAL DISTRIBUTION: Greater Antilles except Cuba; Trinidad.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: Wet forests at high elevations; plants rare.

5. **Diplazium grandifolium** (Sw.) Sw. in J. Bot. Schrader **1800**(2): 62. 1801.

Basionym: *Asplenium grandifolium* Sw., Prodr. 130. 1788.
Type: *Swartz*, from Jamaica.

Rhizome erect, 1.5–2.5 cm. thick, clothed at apex with thick, blackish acuminate scales. Fronds to 1.1 m. long; stipes blackish-brown, one-half to nearly as long as the blades. Blades lance-oblong, 30–70 cm. long, 15–30 cm. broad, truncate at base, 1-pinnate; pinnae 10–15 pairs, narrowly oblong, 2–4 cm. broad, rounded-truncate at base, the margins lightly sinuate-crenate or rarely deeply crenate in the basal part, sometimes sharply serrate at the apex; tissue firmly papery to subsucculent, glabrous, the veins pinnately branched, all branches reaching the margin. Sori linear, unequal, to 1.5 cm. long, those on the first distal veinlet usually in pairs; indusium dark brown with a pale, scarious, entire margin.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe (reported by Fée), Grenada. The occurrence of this species in the Lesser Antilles needs further confirmation.

HABITAT: Moist forested hillsides and shaded gullies at middle to higher elevations; plants very rare.

6. **Diplazium legalloi** Proctor in Rhodora **68**: 466. 1966.

Type: *Proctor 20164*, from the vicinity of Ravine Chaude, above Matouba, Guadeloupe (A; isotype, IJ).
Syn.: *Asplenium callipteris* sensu Baker in Hook. & Baker, Syn. Fil. 231. 1867, in part, also Duss, Foug. & Lyc. Antill. Franc. 85. 1903, not *Diplazium callipteris* Fée, 1852.

Morton (Contr. U. S. Nat. Herb. **38**: 235, 236. 1973) has attempted to show that "*Diplazium crenulans* Fée ex Baker in Hook. & Baker" (Syn. Fil. 232. 1867) is the correct name for his species. In my opinion this is not acceptable under the International Rules of Botanical Nomenclature because it was pubished in synonymy (under *Asplenium*), and was not definitely accepted by Baker, who merely said it "is probably a form" of *Asplenium celtidifolium*. His treatment shows that he did not accept *Diplazium* as a genus; he did not even realize that this so called "*Diplazium crenulans*" was in fact the same as the plant he called *Asplenium callipteris* on the preceding page! Morton's studies of fern types are of great importance to students of these plants; however, in this case he has strained to validate a name whose publication was unsatisfactory.

Rhizome erect, clothed at apex with light brown, ovate, lacerate-fimbriate scales. Fronds to 1.7 m. long or more and of heavy, coriaceous texture; stipes to 60 cm. long, deeply grooved, scaly toward base, sparsely clothed with appressed cobwebby hairs. Blades ovate-oblong, often more than 1 m. long, to 60 cm. broad; rhachis deeply grooved on upper side; pinnae 9–11 pairs, lance-oblong, 12–30 cm. long, 5–10 cm. broad, the lower ones short-stalked, the apex acute or subfalcate, the margins subentire to sinuate-crenate (rarely broadly truncate-lobed); tissue very dark green, sparsely appressed-hairy beneath, the veins prominulous, pinnately branched in groups, all upcurved-connivent at the subcartilaginous margins. Sori elongate; indusium narrow, dark brown, ciliolate.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: Wet rain forest ravines at middle elevations; plants rare.

7. **Diplazium godmanii** (Baker) C. Chr., Ind. Fil. 233. 1905.

Basionym: *Asplenium godmanii* Baker in Ann. Bot. 5: 166, *t. 11.* 1891.

Type: *H. H. & G. W. Smith 1019*, from summit of Morne à Garou Mountain, St. Vincent.

Syn.: *Asplenium grandifolium* sensu Duss, Foug. & Lyc. Antill. Franc. 85. 1903, not Sw., 1788.

Rhizome decumbent, massive, succulent, densely clothed at apex with brown, lance-attenuate, denticulate scales. Fronds to 1.5 m. long, subsucculent, glabrous; stipes 20–45 cm. long, grooved, scaly toward the base. Blades 1-pinnate, narrowly elliptic to ovate-oblong, up to more than 1 m. long and 50 cm. broad, narrowed at base and above to the broadly pinnatifid apex; pinnae sessile, 4–7 cm. broad, oblong or linear-oblong, unequally truncate at base, bluntly acuminate (sometimes subfalcate) at apex, the margins entire, the veins pinnately branched, irregularly anastomosing from about halfway to the margins. Sori slender, chiefly along the inner portion of the veins; indusium very narrow (difficult to detect), entire, glabrous.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, *Mazé* (k, ij); Martinique, *Duss 1643* (ny); St. Vincent; Grenada.

Habitat: Wet woodland glades at high elevations; plants rare.

This species seems closely related to *Diplazium hemionitidum* (Baker) C. Chr. of Ecuador, but the latter was described as having nearly naked fronds, whereas *D. godmanii* is clothed with numerous small to minute scales on the vascular parts beneath. It is likewise not very distinct from *D. pinnatifidum* Kunze of the Andean region, and further study may prove them to be the same. However, from the material available it appears that *D. godmanii* is a much larger species, with normally at least 5 pairs of free pinnae; and also apparently differs in its much narrower or nearly obsolete indusium.

8. **Diplazium limbatum** (Willd.) Proctor in Rhodora **68**: 467. 1966.

Basionym: *Asplenium limbatum* Willd. in L., Sp. Pl. **5**: 310. 1810.
Type: Plumier, Tr. Foug. *t. 106*, based on material probably from Morne de la Calebasse, Martinique.
Syn.: *Asplenium marginatum* L., Sp. Pl. **2**: 1082. 1753.
Hemidictyum marginatum (L.) C. Presl, Tent. Pter. 111, *t. 3*, *fig. 24.* 1836.
Hemidictyum limbatum (Willd.) C. Presl, Epim. Bot. 74. 1852.
Diplazium marginatum (L.) Diels in Engl. & Prantl, Nat. Pflanzenfam. 1(4): 229. 1899, not Blume, 1828.

Very large ferns. Rhizome stout, erect and woody, bearing brownish subclathrate scales at the apex. Fronds several, erect-arching, to 3 m. long or more; stipes to 2 cm. thick at base, half as long as the blades. Blades coarsely 1-pinnate, oblong, 1–2 m. long, to 1 m. broad, glabrous; pinnae numerous, opposite, linear-oblong or ligulate, 25–55 cm. long, 6–12 cm. broad, abruptly short-acuminate, sessile and all but the uppermost cordate-clasping; terminal pinnae like the lateral ones, with margins entire, scarious; tissue bright green, thinly papery, with veins spreading, parallel, close, mostly 1-forked near base and joined again halfway to the margin, giving rise to a network of hexagonal areoles, the outermost joined by a continuous submarginal veinlet. Sori narrowly linear along the main vein branches, to 4 cm. long; indusium narrow, membranous, opening distally.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Wet shaded ravines at lower to middle elevations.

9. **Diplazium cristatum** (Desr.) Alston in J. Bot. **74**: 173. 1936.

Basionym: *Menicium cristatum* Desr. in Lam., Encycl. Méth. Bot. **4**: 94. 1797.
Type: *Joseph Martin*, from Martinique.
Syn.: *Asplenium arboreum* Willd. in L., Sp. Pl. **5**: 320. 1810. (Type from Venezuela.)
Asplenium shepherdii Sprengel in Nova Acta Acad. Caes. Leop.-Carol. **10**: 231, *t. 17*, *figs. 5*, *6*. 1821. (Type from Jamaica.)
Diplazium shepherdii (Sprengel) Link, Fil. Hort. Berol. **2**: 70. 1833.
Diplazium arboreum (Willd.) C. Presl, Tent. Pter. 114. 1836.
Diplazium trinitense Domin, Pter. Dominica 155. 1929, in part.

Rhizome erect or ascending, 1.5–2 cm. thick, giving rise to numerous thick roots below, and clothed at apex with oblong-acuminate, blackish-brown scales. Fronds 50–85 cm. long; stipes slightly shorter than the blades, grooved, scaly at base. Blades broadly ovate to elongate-deltate, up to 35 cm. broad, usually broadest at or near the base; pinnae lanceolate to narrowly ovate, 2–6 cm. broad, acuminate-attenuate at the apex, inequilateral at base (the basiscopic side more or less excavate), the upper ones sessile or adnate, coarsely crenate-lobate to deeply pinnatifid, the lobes 5–10 mm. broad at base; tissue glabrous, with veins simple or forked. Sori linear, arcuate, often solitary and occupying the first distal vein branch at the base of each lobe, only these basal sori being diplazioid.

General Distribution: Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist rocky ravines and hillsides, often near streams, at low to middle elevations.

10. **Diplazium caracasanum** (Willd.) Kunze in T. Moore, Ind. Fil. 324. 1861.

Basionym: *Asplenium caracasanum* Willd. in L., Sp. Pl. **5**: 338. 1810.
Type: *Bredemeyer, Herb. Willd. 19919*, from Caracas, Venezuela (B).
Syn.: *Athyrium caracasanum* (Willd.) Milde in Bot. Zeit. 353. 1870.
Asplenium guildingii Jenman in Gard. Chron. III, **15**: 70. 1894. (Type from St. Vincent.)
Asplenium vincentis Christ ex Krug in Engl. Bot. Jahrb. **24**: 109. 1897. (Type from St. Vincent.)
Diplazium vincentis (Christ) C. Chr., Ind. Fil. 241. 1905.
Diplazium guildingii (Jenman) Hieron. in Hedwigia **59**: 332. 1917.
Diplazium trinitense Domin, Pter. Dominica 155. 1929, in part, with regard to ref. Guadeloupe.

Rhizome erect, 0.5–1 cm. thick, clothed at apex with broadly oblong-acuminate, dark brown scales. Fronds 50–85 cm. long; stipes much shorter than the blades, grooved, scaly at base. Blades linear-oblong to oblong, usually less than 20 cm. broad, widest near or just below the middle; pinnae lanceolate, 1.5–2.5 cm. broad, acuminate-attenuate at apex, equilateral at base, all but the apical ones free, all deeply pinnatifid, the serrate segments 2–5 mm. broad at base, with simple or forked veins, the tissue glabrous, membranous. Sori linear, chiefly occupying the outer veins of the segments, apparently none diplazioid.

General Distribution: Trinidad (?), northern South America.

Distribution in Lesser Antilles: Guadeloupe, St. Vincent.

Habitat: Not stated, but probably moist shaded gullies at middle elevations; plants rare.

Although closely related to *Diplazium cristatum*, this plant seems to differ significantly in several characters, and true intermediates have not been seen. Further collecting is needed, together with careful observations in the field.

11. **Diplazium apollinaris** L'Herminier ex Fée, Mém. Fam. Foug. **11**: 40, *t. 10, fig. 1.* 1866.

Type: *Germain in 1861*, from near Matouba, Guadeloupe.
Syn.: *Asplenium callipteris* var. *pinnatisectum* Christ in Engl. Bot. Jahrb. **24**: 107. 1897. (Type from Guadeloupe.)
Diplazium costale sensu Duss, Foug. & Lyc. Antill. Franc. 86. 1903, not *Asplenium costale* Sw., 1801.
Diplazium callipteris var. *pinnatisectum* (Christ) Christ ex Bonaparte, Notes Pter. **7**: 344. 1918.

Rhizome unknown. Fronds to more than 1 m. long, of heavy, firm texture, the tissue dark green (sometimes minutely white-dotted beneath); stipe and rhachis deeply grooved on upper side, glabrous. Blades deltate-oblong, pinnate-pinnatifid, often viviparous; pinnae linear-oblong, to 30 cm. long, 2.5–7 cm. broad, acuminate, the lower ones short-stalked; costae grooved on upper side (the groove glabrous within), beneath bearing a few small, flaccid, pale brown, narrow-attenuate scales; segments broadly oblong or deltate-oblong, mostly 10–15(–18) mm. broad, rounded or acute-subfalcate, essentially entire, cut ⅔ to the costa with very narrow, acute sinuses, the veins mostly 6–8 pairs per segment, all simple, the midvein with a few flaccid-appressed hairs beneath. Sori to 10 mm. long; indusium dark brown, subclathrate, the margin minutely fimbriate-ciliolate.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Wet glades in rain forest at middle to higher elevations; plants very rare, not collected in the present century.

This species is apparently responsible for erroneous reports of *Diplazium costale* (Sw.) C. Presl from the Lesser Antilles.

12. **Diplazium striatum** (L.) C. Presl, Tent. Pter. 114. 1836.

Basionym: *Asplenium striatum* L., Sp. Pl. **2**: 1082. 1753.
Type: Petiver, Pter. Amer. *t. 3, figs. 3, 4*, copied from Plumier, Tr. Foug. *t. 18, 19*, based on material from "les bois de la Cabsterre," Martinique. The specimen of "*Asplenium striatum ?*" in the Linnaean Herbarium is the plant we are calling *Diplazium cristatum* (Desr.) Alston and probably was a later insertion.
Syn.: *Diplazium truncatum* C. Presl, Tent. Pter. 114. 1836, nomen nudum. (Type from Grenada.)
Diplazium crenulatum Liebm. in Dansk. Vid. Selsk. Skr. V, **1**: 254. 1849.
Asplenium crenulatum (Liebm.) Baker in Hook. & Baker, Syn. Fil. 236. 1867, not C. Presl, 1836, nor Baker in Hook. & Baker, Syn. Fil. 224. 1867.
Diplazium striatum var. *truncatum* Hieron. in Hedwigia **59**: 328. 1917.

Rhizome stout, erect or ascending, to 30 cm. long, the apex bearing numerous ovate to lance-attenuate, dark brown scales with entire margins. Fronds 1–2 m. long; stipes mostly shorter than the blades, grooved, scaly at base. Blades pinnate-pinnatifid, narrowly to broadly oblong, 25–50 cm. broad, acuminate at apex; pinnae numerous, narrowly oblong-acuminate, 3–6 cm. broad, deeply and evenly pinnatifid throughout; segments close, oblong, rounded or truncate or somewhat acute, the sinuses acute, the margins distantly crenulate-serrulate, the veins about 10 pairs per segment, simple or 1- to 2-forked. Only the basal sori of each segment diplazioid; indusium uniformly brown, entire.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist shady ravines at chiefly middle elevations.

This is usually considered a variable or polymorphic species, but the Lesser Antillean population seems quite uniform.

13. **Diplazium l'herminieri** Hieron. in Urban, Symb. Antill. 4: 648. 1911.

Type: *L'Herminier in 1861*, from Guadeloupe (B).
Syn.: *Diplazium grammatoides* Fée, Mém. Fam. Foug. 11: 43, *t. 11.* 1866, not C. Presl, 1851.

Rhizome erect or ascending, woody, 1–2 cm. thick, clothed at apex with dark brown, deltate-ovate, attenuate, sharply denticulate scales. Fronds laxly arching, 0.7–1.3 m. long; stipes much shorter than the blades, dark brown, laxly scaly. Blades ovate-oblong to lanceolate, 25–50 cm. broad, slightly narrowed at base, long-tapering-acuminate at apex, pinnate-pinnatifid or 2-pinnate; rhachis sometimes viviparous toward the upper end; pinnae 12–18 pairs, usually rather distant, narrowly oblong, long-acuminate, 4–6(–9) cm. broad; segments or pinnules oblong, 0.6–1.2 cm. broad, rounded or blunt at the apex, usually somewhat adnate at base, the margins crenate-serrate (in larger fronds the pinnules are usually pinnatifid with entire lobes). Sori linear, 2–3 mm. long (rarely more); indusium lacerate-fimbriate. Sporangia few.

General Distribution: Greater Antilles except Jamaica.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Moist slopes and ravines in rain forest areas at middle elevations; plants rare and local.

14. **Diplazium expansum** Willd. in L., Sp. Pl. 5: 354. 1810.

Type: *Bredemeyer, Herb. Willd. 11948*, from Caracas, Venezuela (B).
Syn.: *Diplazium ambiguum* Raddi in Opusc. Sci. Bol. 3: 292. 1819. (Type from Brazil.)

Aspenium radicans sensu Duss, Foug. & Lyc. Antill. Franc. 87. 1903, in part, not L., 1759, nor Swartz, 1806.

Morton & Lellinger (Amer. Fern J. **61**: 161. 1971) have argued that the St. Vincent plants cited here should bear the name *Diplazium ambiguum* and not *D. expansum* (they consider these different species) because they "lack the usually abundant hairs on the lower surface of the costae and costules of that species and have entire, not ciliate-erose, indusia." In my opinion, these differences are merely quantitative, not qualitative, and may reflect differences in the age of specimens being examined or perhaps some permissible variability in the species. They have cited two Morton collections from St. Vincent as matching type material of *D. ambiguum*; however, material has been collected from St. Vincent (*Proctor 26160*) which has costal hairs like those of *D. expansum* but less abundant, and with indusium slightly erose and definitely ciliate when young. It seems evident that further study of these closely related (if not identical) plants is needed throughout their rather extensive geographic range. Meanwhile, I prefer to apply the oldest valid name for the group as a whole. Morton and Lellinger seem to imply that Morton's collections were the first records of this taxon from St. Vincent; however, H. H. & G. W. Smith collected plentiful material of this species in 1889–90.

Rhizome stout, suberect, 15–20 cm. long, clothed at the apex with thick, elongate, brown scales. Fronds arching, 1.2–3 m. long; stipes pubescent, much shorter than the blades. Blades narrowly ovate, long-acuminate, 40–80 cm. broad, 2-pinnate-pinnatifid, glabrous to more or less hirtellous at least on the vascular parts beneath, and also bearing a few scattered small brown deciduous scales; rhachis and costae deeply grooved on upper (adaxial) side; pinnae 10–15 pairs, long-stalked, oblong-acuminate, the larger ones 8–15 cm. broad; pinnules narrowly deltate-oblong, acuminate to attenuate at the apex, subtruncate at base, 1.5–2 cm. broad, lobed about halfway to the costule, the lobes oblong with distantly denticulate margins, the veins simple. Sori 2–4 pairs per segment, the longest 3–5 mm. long; indusium usually laxly erose-ciliate.

General Distribution: Greater Antilles, northern South America to Brazil.

Distribution in Lesser Antilles: St. Vincent.

Habitat: Moist shaded ravines at middle elevations.

Doubtful Records

The synonymy of *Diplazium* is much confused, as no modern monographic study of the genus exists. The following unplaced names were attributed to Lesser Antillean material by Fée (Mém. Fam. Foug. 11: 41, 42. 1866), but their application to actual plants of our area remains doubtful.

Diplazium arboreum β otites "Moor. et Houls" (= *Diplazium otites* T. Moore & Houlst. in Gard. Mag. Bot. 3: 231. 1851. Type from St.

Vincent). This is probably a form of *Diplazium cristatum* (Desr.) Alston.

Diplazium expansum β glabriusculum T. Moore, Ind. Fil. 328. 1861. (Type: *Garnier 402*, from Martinique.) This may be the same as the St. Vincent plants that Morton and Lellinger have equated with the Brazilian species *Diplazium ambiguum* Raddi, and which I consider a form of *Diplazium expansum*. However, there are no modern collections of the latter species from Martinique, and I have not seen Moore's material.

Diplazium ottonis Klotzsch in Linnaea 20: 360. 1847, ascribed by Fée to Martinique, "fide Th. Moore, Index." This was probably a misidentification of the plant we are now calling *Diplazium striatum* (L.) C. Presl.

Diplazium "wagenerianum, Al. Braun," Ind. Sem. Hort. Berol., 1855, evidently a miscitation of *D. wageneri* Klotzsch ex A. Braun. I do not know what this might be.

A large, probably undescribed species of *Diplazium* was collected on the northwest slopes of Morne Diablotin, Dominica (*W. H. & B. T. Hodge 2785* (GH)), in 1940. It is 1-pinnate with entire pinnae to 5 cm. broad and free veins, the whole frond 1.4 m. long or more. As the material seen is incomplete, formal description is deferred. Collectors should watch for this species.

Subfamily THELYPTERIDOIDEAE

KEY TO THE GENERA

a. Blades 3- to 4-pinnate, clothed beneath with long pluricellular simple hairs; veins free, the tips enlarged and not reaching the margins .... 40. *Macrothelypteris*

a. Blades 1-pinnate or 1-pinnate-pinnatifid (rarely simple), glabrous or bearing short simple, forked, or stellate hairs; veins free to reticulate, the free tips mostly reaching the margins .... 41. *Thelypteris*

MACROTHELYPTERIS (H. Ito) Ching

Macrothelypteris (H. Ito) Ching in Acta Phytotax. Sin. 8: 308. 1963. FIGURE 54.

Basionym: *Thelypteris* sect. *Macrothelypteris* H. Ito in Nakai & Honda, Nova Flora Jap. 4: 141. 1939.

Syn.: *Thelypteris* subg. *Euphegopteris* Ching, "*group 10*" Ching in Bull. Fan. Mem. Inst. Biol., Bot. 6: 248. 1936.

Medium-sized terrestrial ferns. Rhizomes creeping, clothed with more or less ciliate scales. Fronds subdistichous or loosely clustered. Blades of ample size and mostly 3- to 4-pinnate, clothed throughout with long unbranched pluricellular hairs (rarely glabrescent), these white or color-

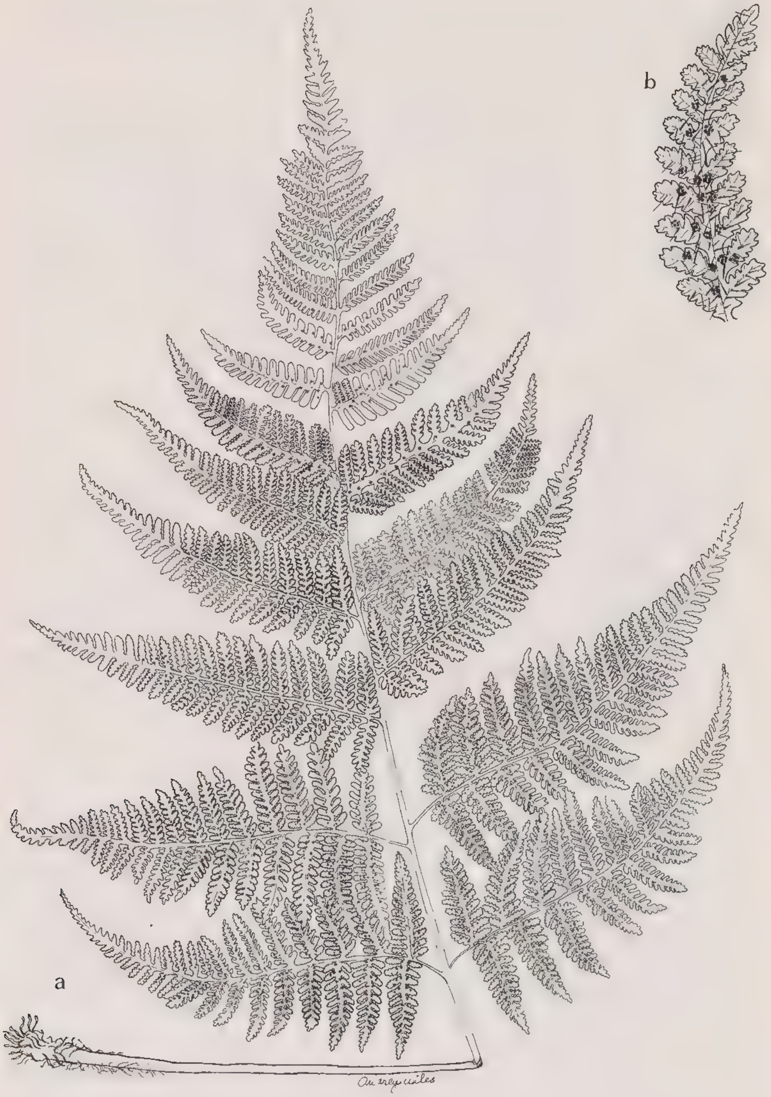

FIGURE 54. **Macrothelypteris.** a, b, *M. torresiana*: a, habit, × 0.4; b, enlarged pinnule showing venation, sporangia, and pluricellular hairs, × 1.0.

less, the veins all free, with enlarged tips not reaching the margins, the ultimate ones simple or with a short spur bearing a sorus. Sori small; indusium lacking or rudimentary and quickly deciduous.

TYPE SPECIES: *Macrothelypteris oligophlebia* (Baker) Ching, based on *Nephrodium oligophlebium* Baker of central and eastern China.

A genus of about ten species as defined by Ching, all indigenous to tropical and subtropical Asia. A single aggressive, weedy species has established itself in the American tropics, apparently within the last century, and is becoming increasingly common in parts of the Lesser Antilles.

1. **Macrothelypteris torresiana** (Gaud.) Ching in Acta Phytotax. Sin. **8**: 310. 1963.

Basionym: *Polystichum torresianum* Gaud. in Freyc., Voy. Bot. 333. 1828.
Type: *Gaudichaud*, probably from Guam.
Syn.: *Polypodium trichodes* Reinw. ex J. Smith in J. Bot. Hook. **3**: 394. 1841, nomen nudum.
Aspidium uliginosum Kunze in Linnaea **20**: 6. 1847.
Lastrea torresiana (Gaud.) T. Moore, Ind. Fil. 86. 1858.
Dryopteris lasiocarpa Hayata in J. Coll. Sci. Univ. Tokyo **30**: 417. 1911.
Dryopteris tric[h]odes [Reinw.] Rosenst. in Med. Riks. Herb. **31**: 6. 1917.
Dryopteris setigera sensu C. Chr. in Dansk. Vid. Selsk. Skr. VIII, **6**: 16. 1920, not *Cheilanthes setigera* Blume, 1828.
Dryopteris uliginosa (Kunze) C. Chr., Ind. Fil. Suppl. **III**: 100. 1934.
Thelypteris uliginosa (Kunze) Ching in Bull. Fan Mem. Inst. Biol., Bot. **6**: 342. 1936.
Thelypteris oligophlebia var. *lasiocarpa* (Hayata) H. Ito in Nakai & Honda, Nova Flora Jap. **4**: 144. 1939.
Thelypteris torresiana (Gaud.) Alston in Lilloa **30**: 111. 1960.

Rhizome stout, short-creeping or ascending, densely clothed at the green apex with brown, linear-attenuate, ciliate scales, these up to 8 mm. long. Fronds close, arching, variable in size, reaching 2 m. in length but commonly fertile when very much smaller; stipes mostly 20–35 cm. long (rarely to 75 cm.), pale green and glaucous at first, becoming straw-colored, densely scaly toward the base, the scales like those of the rhizome apex, otherwise glabrate and minutely stipitate-glandular. Blades deltate-ovate to deltate-lanceolate, longer than the stipes, to 1.5 m. long (or perhaps longer), mostly 20–60 cm. broad, long-acuminate, the apex pinnatifid; tissue membranous, the veins 3–5 pairs in the ultimate divisions, simple or (when fertile) 1-forked; smallest fertile blades 2-pinnate-pinnatifid, the largest 3-pinnate-pinnatifid to 4-pinnate; rhachis 2-grooved on upper side, the grooves separated by a rounded, pubescent ridge, otherwise sparsely and minutely stipitate-glandular; pinnae deltate-lanceolate or lanceolate, attenuate, short-stalked; ultimate divisions oblong-falcate or linear-oblong, mostly 1.5–2 mm. broad, subentire to crenate-denticulate; costae narrowly green-winged, the costules whitish short-pubescent above, the vascular parts beneath bearing numerous long, white pluricellular hairs. Sori medial; indusium minute, soon deciduous, the sorus usually appearing to lack an indusium. Sporangia glabrous.

General Distribution: Tropical southeast Asia and adjacent islands; now naturalized in Florida, Jamaica, Trinidad, South America, and probably other areas.

Distribution in Lesser Antilles: St. Vincent, Grenada.

Habitat: Moist shady banks, especially in disturbed soil, at chiefly middle elevations. In time, this species will undoubtedly be found on all the islands with moist climates.

THELYPTERIS Schmidel

Thelypteris Schmidel, Icon. Pl. (ed. Keller) 45, *t. 11.* 1762.

Figure 55.

Small to moderately large terrestrial ferns. Rhizomes slender and wide-creeping to thick and erect, clothed at the apex with scales that are often more or less hairy. Fronds scattered to fasciculate; stipes not articulate. Blades usually 1-pinnate to 1-pinnate-pinnatifid (rarely simple), not or but slightly dimorphic, glabrous or commonly pubescent, the hairs simple, forked or stellate, the veins either free, more or less connivent at sinuses, or variously reticulate (adjacent pairs of veins joined, at their junction producing a short, simple excurrent veinlet). Sori roundish or elliptic (rarely somewhat elongate), dorsal on veins, with or without indusium; indusium (if present) usually roundish-reniform, attached at the sinus. Spores bilateral, monolete, with variously sculptured perispore.

Type species: *Thelypteris palustris* (Salisb.) Schott, based on *Polypodium palustre* Salisb., a semicosmopolitan species of temperate and subtropical regions of both hemipheres. The oldest name for this species is *Acrostichum thelypteris* L. (1753), but the Linnaean species epithet cannot be used when the generic name is the same. Morton (Contr. U. S. Nat. Herb. 38: 71. 1967) has suggested that the correct specific name for this plant may be *Thelypteris confluens* (Thunb.) Morton, if the South African population is considered conspecific with the plants of Europe and North America.

Thelypteris, in the broad sense accepted here, is one of the largest genera of ferns, with nearly a thousand species distributed all over the world. This vast taxon has 38 representatives in the Lesser Antilles, eight of these are endemic and one is naturalized from Malaya.

This genus is broken up into a considerable number of smaller genera by some authors. Unfortunately, many of these genera are based on characters which seem difficult to define and appear to overlap when considered on a worldwide basis. However, it is not difficult to recognize

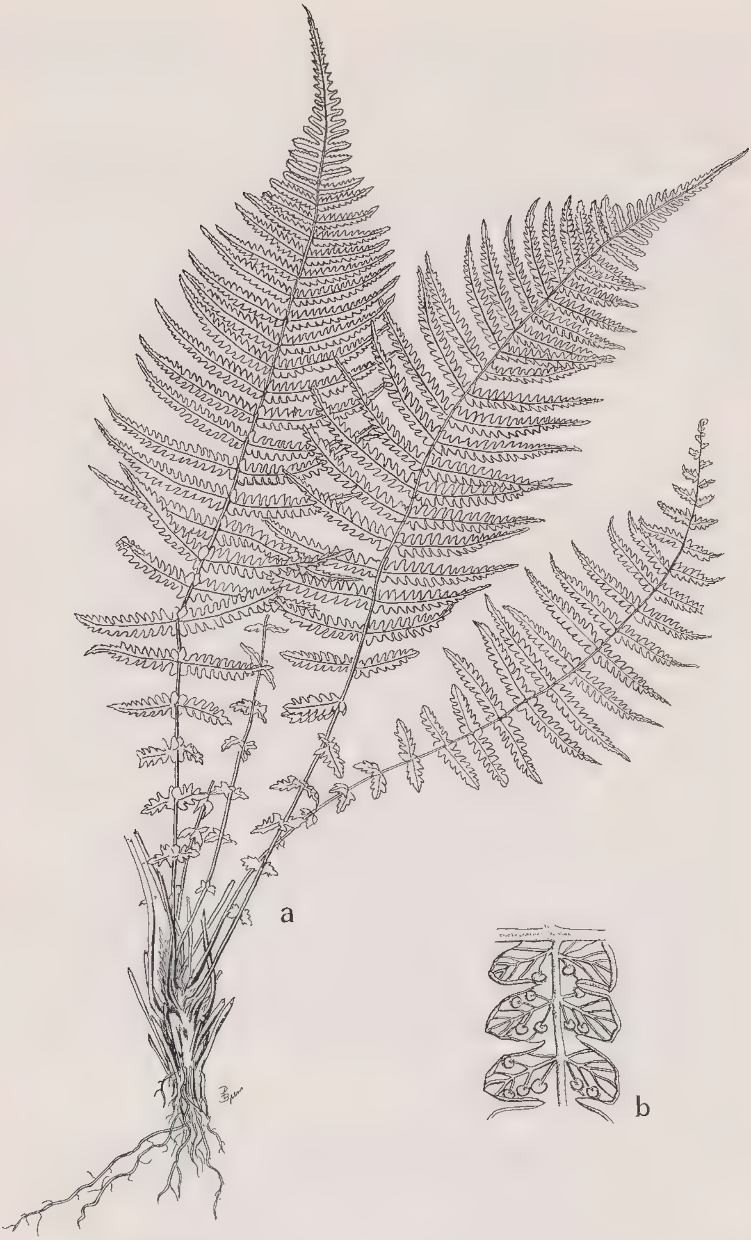

FIGURE 55. **Thelypteris.** a, b, *T. cooleyi*: a, habit, × 0.5; b, section of pinna showing venation and sori, × 3.0.

broad groups of species within the genus, and these taxa can conveniently be treated as subgenera. This practice is followed in the present work.

SPECIAL LITERATURE: Morton, The classification of *Thelypteris*, in Amer. Fern J. **53:** 149–154. 1963. See also the following: Ching, A reclassification of the family *Thelypteridaceae* from the mainland of Asia, in Acta Phytotax. Sin. **8:** 289–335. 1963; Iwatsuki, Classification of the genus *Thelypteris*, in Acta Phytotax. Geobot. **21:** 35–42. 1964; A. R. Smith, Systematics of the neotropical species of *Thelypteris* sect. *Cyclosorus* in Univ. Calif. Publ. Bot. **59:** 1–143. 1971 (a brief comparison of the schemes of classification is given in "Nomenclatural history and classification," pp. 41–47); A. R. Smith, A revised classification of *Thelypteris* subg. *Amauropelta* in Amer. Fern J. **64:** 83–95. 1974 (a very interesting and useful preliminary classification of subg. *Amauropelta*; however, no attempt has been made in the present work to arrange the species of subg. *Amauropelta* according to Smith's sections).

KEY TO THE SUBGENERA

a. Veins all free, reaching the margins above the sinus; hairs always simple; sessile, reddish-resinous glands sometimes present on the tissue beneath . . . . Subg. *Amauropelta*

a. At least the lowest pairs of veins (on adjacent lobes or segments) either joined in the tissue or at least connivent at or below the sinus (in *Thelypteris clypeolutata* the costa is joined to the sinus by a cartilaginous pseudovein, the true veins all being free, and in *T. quadrangularis* var. *inconstans* and *T. extensa* some fronds or pinnae have free veins, the latter also having numerous minute sulphur-yellow glands along the veins beneath); sessile, reddish-resinous glands lacking.
  b. Sori round, distinct, or if not round, at least some of the veins free.
    c. All hairs simple (never forked or stellate); sori with large, distinct indusium (but this lacking in *T. glandulosa*) . . . . Subg. *Cyclosorus*
    c. Hairs, at least on the rhizome scales (and usually elsewhere) forked or stellate (simple hairs may also be present); indusium minute, vestigial, or lacking . . . . Subg. *Goniopteris*
  b. Sori oblong to linear, more or less confluent along adjacent anastomosing veins; veins all joined, forming areoles containing excurrent free veinlets terminating in the tissue . . . . Subg. *Meniscium*

Subgenus AMAUROPELTA

KEY TO THE SPECIES

a. Lower surface of frond tissue bearing sessile, globular, reddish, orange, or yellowish resinous glands.
  b. Indusium with hairs (sometimes few), or else indusium absent or minute.
    c. Segments with less than 10 pairs of veins.
      d. Longest pinnae mostly with less than 14 pairs of segments; rhizome scales bearing either reddish glands or hairs.
        e. Pinnae strongly unequal-sided; hairs of underside (if any) few, acicular, and confined to the vascular parts; rhizome scales with reddish glands.

f. Indusium absent or minute .... 1. *T. sancta*

f. Indusium large, persistent .... 2. *T. consanguinea*

e. Pinnae about equal-sided; hairs of underside numerous throughout (those of tissue surface hamate); rhizome scales with hairs .... 11. *T. gracilis*

d. Longest pinnae mostly with more than 17 pairs of segments (except in depauperate or immature plants), nearly equal-sided; hairs beneath few, acicular; rhizome scales naked, lacking both hairs and glands .... 3. *T. opposita*

c. Segments with more than 25 pairs of veins; indusium minute, ciliate, soon disappearing; a linear-attenuate brown aerophore present at base of each pinna .... 16. *T. decussata*

b. Indusium without hairs.

g. Rhachis glabrous but usually bearing minute stipitate glands; a small knoblike aerophore normally present at base of each pinna beneath.

h. Pinnae strongly unequal-sided, the longer segments having veins in 3–5 pairs; indusium pale brown; minute stipitate glands usually few .... 2. *T. consanguinea*

h. Pinnae subequal-sided, the segments mostly with 7–8 pairs of veins (rarely to 13 pairs); indusium dark purple-brown; minute stipitate glands many .... 4. *T. limbata*

g. Rhachis with hairs (at least along groove on upper side); aerophores absent; sori medial to supramedial.

i. Rhachis mostly 2–3 mm. thick; segments narrowly oblong, mostly 2–2.5 mm. broad; acroscopic basal segments auriculate on lower side (auricle overlapping the rhachis and not visible from the fertile side) .... 6. *T. balbisii*

i. Rhachis (of mature fronds) 3–5 mm. thick; segments broadly oblong, mostly 3–5 mm. broad; basal segments not auriculate .... 7. *T. pachyrhachis*

a. Lower surface of tissue lacking sessile, globular, reddish to yellowish resinous glands.

j. Sporangia setulose .... 8. *T. concinna*

j. Sporangia glabrous.

k. Sori round or nearly so; indusium usually present (sometimes very small); rhachis lacking proliferous buds.

l. A small knoblike aerophore present at base of each pinna beneath.

m. Hamate hairs present on the vascular parts beneath.

n. Blades mostly less than 9 cm. broad; veins 5–6 pairs per segment; stipes glabrous .... 9. *T. hydrophila*

n. Blades mostly more than 15 cm. broad (to 35 cm.); veins 7–10 pairs per segment; stipes puberulous .... 10. *T. germaniana*

m. Hairs absent beneath; underside vascular parts with minute stipitate glands .... 5. *T. cooleyi*

l. Aerophores absent.

o. Hairs of underside all acicular; indusium elongate, attached laterally .... 12. *T. muscicola*

o. Hairs of underside mostly hamate; indusium roundish-reniform, basally attached.

p. Rhachis scaly, especially the lower part; indusium with hamate hairs .... 13. *T. rustica*

p. Rhachis without scales; indusium bearing acicular hairs .. .. 14. *T. antillana*

k. Sori more or less elongate (oblong to linear), lacking an indusium; axils of upper pinnae often bearing small proliferous buds .... 15. *T. linkiana*

1. **Thelypteris sancta** (L.) Ching in Bull. Fan Mem. Inst. Biol., Bot. 10: 254. 1941.

Basionym: *Acrostichum sanctum* L., Syst. Nat. ed. 10, **2**: 1320. 1759.

Lectotype: Sloane, Hist. **1**: *t. 49, fig. 2*, based on a plant from Jamaica. The specimen of *Acrostichum sanctum* in the Linnaean Herbarium (*1245.8*) is this species, but was probably a later insertion.

Syn.: *Polypodium sanctum* (L.) Sw., Prodr. 133. 1788.
Phegopteris sancta (L.) Fée, Mém. Fam. Foug. **5**: 243. 1852.
Phegopteris tenella Fée, Mém. Fam. Foug. **5**: 243. 1852.
Lastrea sancta (L.) J. Smith, Ferns Brit. & For. 159. 1866, not T. Moore, 1858.
Nephrodium sanctum (L.) Baker in Hook. & Baker, Syn. Fil. 267. 1867.
Dryopteris sancta (L.) Kuntze, Rev. Gen. Pl. **2**: 813. 1891.
Lastrea linnaeana Copel., Gen. Fil. 139. 1947.

Rhizome ascending to erect, the apex with a few small, ovate, dark brown, glabrous, clathrate scales. Fronds tufted; stipes very short, usually less than 3 cm. long. Blades oblanceolate, less than 15 cm. long and 4 cm. broad (in Lesser Antillean specimens), attenuate below, the lowest pinnae minute and unequally 3-foliate; rhachis and costae minutely puberulous in 2 lines on upper side, remainder of blade nearly glabrous (sometimes a few scattered hairs on vascular parts); larger pinnae ca. 2 cm. long, narrowly deltate-lanceolate, unequal-sided; segments oblique, linear-oblong, roundish at apex, entire or lightly crenate, with mostly 3–6 pairs of veins. Sori medial, small.

General Distribution: Greater Antilles, Central America, northern South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: On shaded rocky banks beside streams and trails; plants rare in the Lesser Antilles.

A hybrid between *Thelypteris sancta* and *T. consanguinea* has been described (*Dryopteris consanguinea* × *sancta* Domin, Pter. Dominica 194. 1929) based on material collected by Domin from Macoucherie Ridge, Dominica. I have not seen this material.

2. **Thelypteris consanguinea** (C. Chr.) Proctor in Rhodora **61**: 306. 1959 (1960), emend.

Basionym: *Dryopteris consanguinea* C. Chr. in Dansk. Vid. Selsk. Skr. VII, **4**: 297, *fig. 21.* 1907.

Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Aspidium consanguineum* Fée, Mém. Fam. Foug. **11:** 76, *t. 20, fig. 3.* 1866, not Kunze ex Mettenius, 1858.

Rhizome decumbent to suberect, the apex bearing relatively large, lanceolate to ovate, brown, glabrous scales. Fronds tufted; stipes short, mostly 2–4 cm. long, glabrous. Blades lanceolate, to 35 cm. long and 8 cm. broad (usually smaller), narrowed below, nearly glabrous but somewhat glandular beneath; pinnae opposite, more or less obliquely ascending; segments oblique, mostly acute, the proximal basal segment of each pinna the largest and often overlapping the rhachis, with 3–5 pairs of veins, usually forked in the proximal basal segments, otherwise simple. Sori submarginal; indusium more or less reniform, sparingly pilose (in specimens from Guadeloupe) or glabrous (in specimens from Dominica and (?) Martinique), persistent.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique (cited by Christensen).

Habitat: Mossy boulders, ledges, and cliffs along streams.

The typical form of *T. consanguinea* is apparently confined to Guadeloupe; the Dominica population differs rather consistently in general appearance and in some details, and should probably be recognized as a geographic variety. Specimens attributed to this species from St. Vincent and Grenada are now considered to represent a different species (*Thelypteris cooleyi*). Christensen's record from Trinidad (Dansk. Vid. Selsk. Skr. VII, **10:** 131. 1913) was apparently an error and his Panama citation refers to another closely related species.

3. **Thelypteris opposita** (Vahl) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10:** 251. 1941.

Basionym: *Polypodium oppositum* Vahl, Eclog. Amer. **3:** 53. 1807.
Type: *Ryan*, from Montserrat (BM, isotype).
Syn.: *Aspidium conterminum* Willd. in L., Sp. Pl. **5:** 249. 1810. (Type from Martinique.)
Polypodium plumieri Desvaux in Ges. Naturf. Freunde Berlin Mag. **5:** 316. 1811.
Aspidium polyphyllum Kaulf. in Flora (Regensburg) **6:** 362. 1823. (Type from Martinique.)
Nephrodium conterminum (Willd.) Desvaux in Mém. Soc. Linn. Paris **6:** 255. 1827.
Lastrea contermina (Willd.) C. Presl, Tent. Pter. 75. 1836.
Phegopteris delicatula Fée, Mém. Fam. Foug. **11:** 51, *t. 20, fig. 1.* 1866. (Type from Guadeloupe.)
Aspidium pachychlamys Fée, Mém. Fam. Foug. **11:** 77, *t. 21, fig. 2.* 1866. (Type from Guadeloupe.)
Aspidium strigosum Fée, Mém. Fam. Foug. **11:** 78, *t. 22, fig. 2.* 1866, not Willd., 1810, nor Mettenius, 1858. (Type from Guadeloupe.)

Dryopteris contermina (Willd.) Kuntze, Rev. Gen. Pl. **2**: 812. 1891.
Nephrodium oppositum (Vahl) Diels in Engl. & Prantl, Nat. Pflanzenfam. **1**(4): 172. 1899, not Fée, 1857.
Dryopteris opposita (Vahl) Urban, Symb. Antill. **4**: 14. 1903, not Kuntze, 1891.
Dryopteris delicatula (Fée) C. Chr. in Dansk. Vid. Selsk. Skr. VII, **4**: 294. 1907.
Thelypteris delicatula (Fée) Proctor in Rhodora **61**: 306. 1959 (1960).

Rhizome erect, the apex bearing a few brownish scales; stipes very short or nearly lacking, seldom more than 2 cm. long. Blades linear-lanceolate to linear-oblanceolate, mostly 25–100 cm. long, 5–15 cm. broad, acuminate, gradually narrowed below, with many pairs of reduced pinnae; pinnae opposite or alternate, at right angles to rhachis, linear-attenuate, 5–15 mm. broad at the base; segments broadly oblong to deltate-ovate, the sinuses open, acute, the veins simple, mostly 5–7 pairs. Sori medial; indusium small, strongly resinous-glandular. Sporangia glabrous.

General Distribution: Puerto Rico, Tobago, Trinidad, northern South America.

Distribution in Lesser Antilles: Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist banks and ravines, at chiefly middle to higher elevations.

This species often produces sori and spores when very small and juvenile in appearance. Such a precocious juvenile form was probably the basis of Fée's *Phegopteris delicatula*, sometimes considered a distinct species.

4. **Thelypteris limbata** (Sw.) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Aspidium limbatum* Sw. in J. Bot. Schrader **1800**(2): 35. 1801.
Type: *Fahlberg*, from Guadeloupe.
Syn.: *Nephrodium limbatum* (Sw.) Desvaux in Mém. Soc. Linn. Paris **6**: 260. 1827.
Amauropelta breutelii Kunze, Farrnkr. **1**: 109, *t. 51*. 1843. (Type from St. Kitts.)
Lastrea breutelii (Kunze) T. Moore, Ind. Fil. 59. 1857.
Lastrea limbata (Sw.) T. Moore, Ind. Fil. 95. 1858.
Dryopteris limbata (Sw.) Kuntze, Rev. Gen. Pl. **2**: 813. 1891.

Rhizome erect, clothed at apex with lance-attenuate, light brown, glabrous scales; stipes short (2–7 cm.), black at extreme base, straw-colored above, glabrous. Fronds apparently of slow growth, the apices often still uncoiling after the lower parts are mature, thus appearing of indefinite growth. Blades lanceolate to broadly oblanceolate, 35–75 cm. long, 12–24 cm. broad; rhachis and costae incurved–strigillose above, beneath with a few similar hairs, or else glabrous and minutely stipitate-glandular;

pinnae linear-attenuate, deeply pinnatifid, each with a small truncate-conical aerophore at base beneath; segments linear-oblong, acute at apex, slightly expanded at base, the margins crenate-dentate, often revolute; tissue glabrous, mostly with sessile reddish or yellow glands beneath, the veins in 7–10 pairs, simple or forked; acroscopic basal segments enlarged and overlapping the rhachis. Sori usually located on marginal teeth; indusium large, dark purple-brown, persistent, with or without minute stipitate glands.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Nevis, Guadeloupe, Martinique.

Habitat: Exposed slopes and low montane thickets on the summits of volcanic mountains.

5. **Thelypteris cooleyi** Proctor in Rhodora **68**: 468. 1966.

Type: *Proctor 26008*, from the Soufriere volcano, St. Vincent (IJ, holotype; isotypes A, U, US, USF).

Syn.: *Dryopteris consanguinea* var. *aequalis* C. Chr. in Smiths. Misc. Coll. **52**: 380. 1909, with regard to Grenada citation only, not type.

Rhizome erect, 0.4–1 cm. thick, clothed at apex with numerous lustrous brown, lance-attenuate, minutely glandular scales. Fronds fasciculate, of wiry texture; stipes relatively very short, 1.5–5 cm. long, minutely stipitate-glandular but otherwise glabrous. Blades oblanceolate, 20–75 cm. long, 7–15 cm. broad, acuminate, long-attenuate below, the several lowest pairs of pinnae distant, auriculiform; rhachis straw-colored, minutely incurved-puberulous in two lines on the upper side, otherwise glabrous but sparsely and minutely stipitate-glandular; pinnae 23–35 pairs, opposite, narrowly lance-linear, subequal-sided, 5–51 mm. broad at the sessile base, attenuate-falcate at apex, deeply pinnatifid, glabrous; segments slightly oblique, deltate-oblong, mostly 2–3 mm. broad at base, acute; lowest acroscopic segment of each pinna usually enlarged, ovate, overlapping the rhachis, with forked veins and serrate margins, the veins 4–6 pairs, simple, the margins of fertile segments usually revolute. Sori submarginal; indusium roundish-reniform, ca. 0.8 mm. broad, reddish-brown, minutely stipitate-glandular. Sporangia glabrous.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Vincent, Grenada.

Habitat: Moist scree slopes, sheltered gullies, ledges, and montane woodlands at high elevations.

6. **Thelypteris balbisii** (Sprengel) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10**: 250. 1941.

Basionym: *Polypodium balbisii* Sprengel in Nova Acta Acad. Caes. Leop.-Carol. **10**: 228. 1821.

Type: *Bertero* (misspelled "Bertier" by Sprengel), from Puerto Rico. The Bertero specimen at Berlin long accepted as the type of *Polypodium balbisii* does not, according to Morton, fit Sprengel's description, and is in fact a form of the species now called *Thelypteris sancta* (L.) Ching. The existence of this specimen is the reason for the use of the epithet *balbisii* in a varietal sense under *T. sancta* by many authors. An authentic type specimen of true *P. balbisii* as described by Sprengel is not known to exist, so that in effect the name must be typified by the description alone. Until a proper Bertero type is located, I designate *W. H. & B. T. Hodge 1203*, from Dominica (GH), as neotype in order to fix the application of the name.

Syn.: *Aspidium sprengelii* Kaulf. in Flora (Regensburg) **6**: 365. 1823. (Type from Martinique.)

Lastrea sprengelii (Kaulf.) C. Presl, Tent. Pter. 75. 1836.

Nephrodium sprengelii (Kaulf.) Hook, Sp. Fil. **4**: 94. 1862.

Phegopteris adenochrysa Fée, Mém. Fam. Foug. **5**: 245. 1852. (Type: *Mlle. Rivoire*, from Martinique (P).) *P. adenochrysa* was wrongly placed in the synonymy of *Thelypteris concinna* by Christensen, apparently due to a suggested comparison by Fée himself in his 1866 treatise on Antillean ferns. I have seen authentic type material at Paris.

Aspidium berteroanum Fée, Mém. Fam. Foug. **11**: 77, *t. 22, fig. 1* (wrongly cited in Fée's text as *t. 21, fig. 3*). 1866. (Syntypes from Guadeloupe and Puerto Rico.)

Dryopteris sprengelii (Kaulf.) Kuntze, Rev. Gen. Pl. **2**: 813. 1891.

Dryopteris balbisii (Sprengel) Urban, Symb. Antill. **4**: 14. 1903.

Dryopteris harcourtii Domin in Kew Bull. **1929**: 219. 1929; Pter. Dominica 198, *t. 34, fig. 1*. 1929. (Type from Dominica.)

Thelypteris harcourtii (Domin) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10**: 251. 1941.

Thelypteris sprengelii (Kaulf.) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 65. 1953.

Rhizome erect, the apex bearing glossy light brown, lance-attenuate, glabrous scales; stipes very short (mostly 2–8 cm.), scaly toward base. Blades lance-oblong or lanceolate, 40–110 cm. long, 10–40 cm. broad, narrowed at base, the lowest pinnae vestigial; rhachis and costae strigillose above, minutely stipitate-glandular beneath; pinnae oblong-lanceolate with attenuate apex, at right angles to rhachis, deeply pinnatifid; segments linear or linear-oblong, ciliate, the veins mostly 12–18 pairs (or less in unusually small fertile plants), simple. Sori supramedial, often partly concealed by the revolute margins; indusium small, persistent, glandular. Sporangia glabrous.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, Central America, northern South America.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Moist banks and partly shaded gullies, ravines and stream banks at chiefly middle elevations.

The plant described by Domin as *Dryopteris harcourtii* appears to be a form of this species adapted to growth in shade, having unusually long stipes and fewer pinnae. However, I have not seen his material, and therefore cannot be certain.

7. **Thelypteris pachyrhachis** (Kunze ex Mettenius) Ching in Bull. Fan Mem. Inst. Biol., Bot. 10: 253. 1941.

Basionym: *Aspidium pachyrhachis* Kunze ex Mettenius in Abh. Senck. Nat. Ges. Frankfurt 2: 367. (*no. 199*). 1858.

Type: *Moritz 409*, said to be from Merida, Venezuela (but this number at BM is from "Colon. Tovar").

Syn.: *Lastrea pachyrachis* (Kunze ex Mettenius) T. Moore, Ind. Fil. 99. 1858.
Nephrodium pachyrhachis (Kunze ex Mettenius) Hook., Sp. Fil. 4: 100. 1862.
Nephrodium jenmanii Baker ex Jenman in J. Bot. 15: 263. 1877. (Type from Jamaica.)
Dryopteris pachyrachis (Kunze ex Mettenius) Kuntze, Rev. Gen. Pl. 2: 813. 1891.
Dryopteris jenmanii (Baker ex Jenman) C. Chr., Ind. Fil. 272. 1905.
Dryopteris jenmanii var. *vincentis* Domin, Pter. Dominica 208. 1929. (Type from St. Vincent.)

Rhizome ascending, the apex (and stipe bases) bearing brown, glabrous scales; stipes usually 8–12 cm. long, nearly glabrous. Blades broadly lanceolate, to 1.3 m. long and 50 cm. broad, rather abruptly narrowed at base, nearly glabrous throughout, except upper side of rhachis and costae; pinnae linear-oblong, spreading, acuminate, deeply pinnatifid; segments narrowly oblong, somewhat acute and slightly crenulate at the apex, with broad, rounded sinuses and 7–12 pairs of veins. Sori medial or supramedial; indusium rather large, glabrous (or in some forms ciliate), copiously resinous-glandular on the margin. Sporangia glabrous.

General Distribution: Jamaica, Hispaniola, continental tropical America from Panama to Venezuela, Brazil, and Ecuador.

Distribution in Lesser Antilles: St. Vincent.

Habitat: Wet forest glades at high elevations.

Domin's var. *vincentis* was described as "eglandulose." Isotypes (*H. H. & G. W. Smith 855* (BM, GH, IJ)) that I have seen are copiously glandular; however, an apparent lack of glands occurs on immature fronds.

8. **Thelypteris concinna** (Willd.) Ching in Bull. Fan Mem. Inst. Biol., Bot. 10: 251. 1941.

Basionym: *Polypodium concinnum* Willd. in L., Sp. Pl. 5: 201. 1810.
Type: *Bredemeyer, Herb. Willd. 19698*, from Caracas, Venezuela (B).

Syn.: *Phegopteris concinna* (Willd.) Fée, Mém. Fam. Foug. **5**: 243. 1852.
Aspidium concinnum (Willd.) Mettenius, Fil. Hort. Lips. 89. 1856, not Link, 1833.
Lastrea concinna (Willd.) T. Moore, Ind. Fil. 86. 1858.
Nephrodium concinnum (Willd.) Baker in Hook. & Baker, Syn. Fil. 268. 1867.
Dryopteris concinna (Willd.) Kuntze, Rev. Gen. Pl. **2**: 812. 1891.

Rhizome erect or ascending, clothed at apex with broadly ovate, dark brown, glabrous scales; stipes purple-brown, mostly 8–15 cm. long, minutely setulose or glabrescent. Blades lanceolate, 25–60 cm. long, 8–15 cm. broad, narrowed at base; rhachis and other vascular parts (and to a lesser extent the tissue) densely setulose; pinnae linear-lanceolate, 4–8 cm. long; segments oblong, obtuse, or subacute, the margins often slightly reflexed, the veins usually 6–8 pairs, simple. Sori supramedial, small; indusium very minute or lacking. Sporangia setulose.

GENERAL DISTRIBUTION: Greater Antilles except Puerto Rico; continental tropical America from Mexico to northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe (cited by Christensen), Dominica (cited by Domin).

HABITAT: Moist shaded woodland banks; plants very rare.

9. **Thelypteris hydrophila** (Fée) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Phegopteris hydrophila* Fée, Mém. Fam. Foug. **11**: 56, *t. 13, fig. 3*. 1866.
Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Polypodium hydrophilum* (Fée) Baker in Ann. Bot. **5**: 456. 1891.
Dryopteris hydrophila (Fée) C. Chr., Ind. Fil. 271. 1905.

Rhizome erect, the apex clothed with lanceolate, brown, minutely pubescent scales; stipes 2–10 cm. long, nearly or quite glabrous, the bases clothed with lanceolate, brown, minutely pubescent scales. Blades lanceolate or linear-lanceolate, 15–25 cm. long, usually less than 8 cm. broad, abruptly narrowed at base (1–3 pairs of reduced pinnae); pinnae linear-lanceolate, acute or acuminate, with a tuberculiform aerophore at the base of each beneath, the segments oblong, somewhat oblique, obtuse or acute at apex, with margins often reflexed, the veins usually 5–6 pairs, simple. Sori inframedial; indusium very small, ciliate, some of the hairs minutely capitate-glandular.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent.

HABITAT: Wet, dripping cliffs in deeply shaded ravines at middle or higher elevations, or sometimes terrestrial in wet mossy montane woodlands; plants rare.

10. **Thelypteris germaniana** (Fée) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Phegopteris germaniana* Fée, Mém. Fam. Foug. **11**: 55, *t. 13*, *fig. 2*. 1866.
Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Polypodium germanianum* (Fée) Baker in Hook. & Baker, Syn. Fil. 306. 1867.
Dryopteris germaniana (Fée) C. Chr., Ind. Fil. 267. 1905.
Lastrea germaniana (Fée) Copel., Gen. Fil. 139. 1947.

Rhizome suberect, the apex bearing large, pale brown, hairy scales; stipes relatively short (5–12 cm.), brownish, minutely pubescent, and bearing small, pale, irregular or deltate-lanceolate, hirtellous scales. Blades lance-ovate, 50–100 cm. long, 20–35 cm. broad, abruptly narrowed below, the lowest pinnae being vestigial; rhachis and other vascular parts (sometimes also the tissue beneath) finely hirtellous, the hairs spreading and hamate; pinnae narrowly oblong-acuminate, 2–3 cm. broad; segments deltate-oblong to oblong, 1–1.5 cm. long, 5–7 mm. broad at base, evenly strigillose throughout on upper (abaxial) side, the veins 7–10 pairs, simple or rarely forked. Sori approximately medial, round or oval; indusium erect, small, delicate, and ciliate, or sometimes apparently absent.

General Distribution: Greater Antilles.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique.

Habitat: Moist forested slopes at higher elevations.

Juvenile forms (as represented by *Duss 4051*, from Guadeloupe (GH)) are rather similar in dissection to *T. linkiana*. *T. germaniana*, when fertile, can readily be distinguished by the nearly round, indusiate sori.

11. **Thelypteris gracilis** (Heward) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 60. 1953.

Basionym: *Gymnogramme gracilis* Heward in Mag. Nat. Hist. II, **2**: 457. 1838.
Type: *Heward*, from the Parish of Manchester, Jamaica.
Syn.: *Aspidium oligocarpum* (var. "*a*") sensu Griseb., Fl. Br. W. Ind. 691. 1864, not Humb. & Bonpl. ex Willd., 1810.
Gymnogramma gracilis "*β, G. consimilis*" Fée ex Baker in Hook. & Baker, Syn. Fil. 377. 1868.
Gymnogramma consimilis (Fée ex Baker) Jenman in Bull. Bot. Dept Jamaica II, **4**: 203. 1897.
Dryopteris consimilis (Fée ex Baker) C. Chr. in Dansk. Vid. Selsk. Skr. VII, **4**: 314. 1907.
Dryopteris mollicella Maxon in Proc. Biol. Soc. Washington **36**: 49. 1923. (Type from Dominica.)
Dryopteris gracilis (Heward) Domin, Pter. Dominica 210. 1929.

Thelypteris mollicella (Maxon) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10**: 252. 1941.

Thelypteris consimilis (Fée ex Baker) Proctor in Rhodora **68**: 468. 1966. (The separation of the Lesser Antillean population *Thelypteris consimilis* from the Greater Antillean *T. gracilis* was based on faulty observation.)

Rhizome decumbent to erect, clothed at apex with narrowly ovate-oblong, acuminate, bright brown, minutely grayish-strigillose scales, these 2.5–4 mm. long. Fronds fasciculate; stipes short (2–3 cm., rarely to 9 cm.), densely grayish-puberulous, and also bearing a few scales like those of the rhizome. Blades lance-elliptic, 18–70 cm. long, 6–22 cm. broad near or a little below the middle, rather abruptly narrowed at base, the lowermost pinnae vestigial; rhachis puberulous like the stipe; pinnae narrowly oblong, acuminate, symmetric, pinnatifid to within 1–1.5 mm. of the costae; segments oblong, 2–3.5 mm. broad, rounded at apex; frond tissue and vascular parts on upper (adaxial) side densely yellowish-strigillose (hairs all acicular), beneath evenly short-puberulous throughout with erect, mostly hamate hairs, the veins in 4–8 pairs, simple. Sori medial, small; indusium vestigial but persistent, consisting mainly of a tuft of stiff, white, hamate hairs from a glandular base. Sporangia glabrous.

General Distribution: Cuba, Jamaica.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique.

Habitat: Moist upland pastures and borders of rain forests at middle elevations.

12. **Thelypteris muscicola** Proctor in Rhodora **63**: 33. 1961.

Type: *Proctor 19354* from Nevis Peak, Nevis (A; isotype, IJ).

Rhizome erect, scaly at apex, the scales ligulate-attenuate, up to 8 mm. long and 1–1.5 mm. broad, sparsely pubescent; stipes mostly 9–15 cm. long, glabrous. Blades pinnate-pinnatifid, oblong-lanceolate or lanceolate, 45–80 cm. long, 15–22 cm. broad, acuminate at apex, abruptly narrowed at base, with 2–4 pairs of much-reduced pinnae; rhachis and costae strigillose above, nearly glabrous beneath, the minor vascular parts sparsely and minutely hirtellous on both sides; pinnae linear-lanceolate, to 2 cm. cm. broad, acuminate, sessile, deeply pinnatifid; segments oblong, rounded or subacute at apex, flat, 3–4 mm. broad; tissue glabrous beneath and with a few minute hairs above, all hairs acicular, none hamate, the veins 6–10 pairs, simple except those in the lowest of the basal segments. Sori supramedial, oval; indusium ciliate, erect, attached at the longer edge to the vein. Sporangia glabrous.

General Distribution: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Nevis.

HABITAT: Mossy montane woodland at high elevations; plants rare.

13. **Thelypteris rustica** (Fée) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Phegopteris rustica* Fée, Mém. Fam. Foug. **11**: 55, *t. 13, fig. 1.* 1866.
Type: *L'Herminier in 1861*, from Ravine la Rose de Matèliane, Guadeloupe.
Syn.: *Polypodium rusticum* (Fée) Baker in Hook. & Baker, Syn. Fil. 306. 1867, in part.
Dryopteris rustica (Fée) C. Chr., Ind. Fil. 290. 1905.
Dryopteris dominicensis C. Chr. in Smiths. Misc. Coll. **52**: 384. 1909. (Type from Dominica.)

Rhizome erect or ascending, bearing numerous brown, crispate, sparingly fimbriate-ciliate scales; stipes very short (5–10 cm.), densely scaly. Blades ovate-lanceolate, 25–75 cm. long and up to 30 cm. broad, rather abruptly narrowed below, with numerous reduced pinnae, the lowest being vestigial; rhachis densely scaly like the stipe (especially toward base), and also pubescent with spreading, white, hamate hairs, similar hairs also on the costae beneath; entire upper surface of the blade densely appressed-strigillose, the hairs acicular; pinnae narrowly oblong, shortly acuminate, subacute or blunt; segments numerous, very close, oblong, up to 15 mm. long and 7 mm. broad, the apex truncate or subfalcate, the veins 5–10 pairs, simple. Sori small, oval, medial or inframedial; indusium persistent, copiously ciliate with hamate hairs. Sporangia glabrous.

GENERAL DISTRIBUTION: Venezuela (?).

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent.

HABITAT: Moist wooded ravines at higher elevations; plants rare.

Reports of this species from Jamaica were based on confusion with *Thelypteris germaniana.*

14. **Thelypteris antillana** Proctor in Rhodora **63**: 33. 1961.

Type: *Proctor 19587*, from spur of Verchild's Mt. below Dodans (Dos d'Ans) Pond, St. Kitts (A; isotype, IJ).

Rhizome short, erect, densely scaly, the scales narrowly deltate-lanceolate, to 8 mm. long, bright brown, pubescent, occasionally toothed; stipes mostly 5–22 cm. long, scaly at base, puberulous and minutely stipitate-glandular throughout. Blades lanceolate, up to 50 cm. long and 17 cm. broad, acuminate at apex, abruptly narrowed at base, with 1–3 pairs of much-reduced pinnae; rhachis minutely stipitate-glandular; all parts finely pubescent throughout on both sides, some of the hairs beneath being hamate; pinnae linear-lanceolate, to 1.5 cm. broad, acuminate, sessile, deeply pinnatifid; segments numerous, narrowly oblong, acute, with revolute margins and measuring 2–3 mm. broad, the veins 7–10 pairs, simple. Sori round, medial or supramedial; indusium persistent, densely long-ciliate. Sporangia glabrous.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Dominica.

Habitat: Exposed slopes, montane thickets, and mountain summits; plants rare.

15. **Thelypteris linkiana** (C. Presl) R. Tryon in Rhodora **69**: 6. 1967.

Basionym: *Grammitis linkiana* C. Presl, Tent. Pter. 209. 1836.
Type: Presumably a specimen cultivated at Berlin (not seen).
Syn.: *Gymnogramme diplazioides* Desvaux in Mém. Soc. Linn. Paris **6**: 214. 1827 (as "*diplazoïdes*"). (Type from Hispaniola.)
Gymnogramme polypodioides Link, Fil. Hort. Berol. **2**: 50. 1833, not Sprengel, 1827.
Gymnogramme linkiana (C. Presl) Kunze in Linnaea **18**: 310. 1844.
Phegopteris duchassaingiana Fée, Mém. Fam. Foug. **11**: 57, *t. 14, fig. 3.* 1866. (Type from Guadeloupe.)
Nephrodium linkianum (C. Presl) Diels in Engl. & Prantl, Nat. Pflanzenfam. **1**(4): 172. 1899.
Dryopteris diplazioides (Desvaux) Urban, Symb. Antill. **4**: 21. 1903, not Kuntze, 1891.
Dryopteris linkiana (C. Presl) Maxon in J. Washington Acad. Sci. **14**: 199. 1924.
Lastrea linkiana (C. Presl) Copel., Gen. Fil. 139. 1947.
Thelypteris diplazioides (Desvaux) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 59. 1953, not Ching, 1936.

Rhizome erect, bearing lance-attenuate, dark brown, pubescent scales near the apex; stipes relatively long (15–35 cm.), minutely puberulous. Blades lanceolate, 50–100 cm. long, 12–25 cm. broad, gradually narrowed above to the attenuate apex, abruptly narrowed below, with a few greatly reduced pinnae; all parts minutely appressed-strigillose on upper side, beneath bearing erect, hamate hairs chiefly on the vascular parts, the veins 4–8 pairs per pinna, simple; pinnae narrowly deltate-oblong, acuminate, chiefly 1.5–2.5 cm. broad at base, lobed about halfway to the costa, the lobes broadly oblong, 4–8 mm. long, 4–6 mm. broad, roundish or truncate at the apex. Sori mostly linear, along the veins; indusium lacking. Sporangia glabrous.

General Distribution: Greater Antilles except Cuba; continental tropical America from Mexico to Brazil and Bolivia.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Wet rocky woodlands at higher elevations; plants rare.

16. **Thelypteris decussata** (L.) Proctor in Bull. Inst. Jamaica Sci. Ser. 5: 59. 1953.

Basionym: *Polypodium decussatum* L., Sp. Pl. 2: 1093. 1753.
Type: Petiver, Pter. Amer. *t. 2, fig. 5*, copied from Plumier, Tr. Foug. *t. 24*, based on a plant from Morne de la Calebasse, Martinique.
Syn.: *Polypodium grammicum* Sprengel in Neue Entd. 3: 6. 1822. (Type from Martinique.)
? Lastrea decussata C. Presl, Tent. Pter. 75. 1836, nomen nudum, based on "*Aspidium decussatum* Sieb. syn. fil. *n. 189*."
Glaphyropteris decussata (L.) C. Presl in Abh. Bohm. Ges. Wiss. 5: 344. 1848.
Phegopteris decussata (L.) Mettenius, Fil. Hort. Lips. 83, *t. 17*, *fig. 8*. 1856.
Gymnogramme decussata (L.) Fée, Mém. Fam. Foug. 7: 44. 1857.
Polypodium percivalii Jenman ex Baker in Ann. Bot. 5: 456. 1891, nomen nudum; Jenman, Ferns Br. W. Ind. & Guiana 282. 1909. (Type from British Guiana, now Guyana.)
Nephrodium decussatum (L.) Diels in Engl. & Prantl, Nat. Pflanzenfam. 1(4): 171. 1899.
Dryopteris decussata (L.) Urban, Symb. Antill. 4: 19. 1903.
Dryopteris percivalii (Jenman) C. Chr., Ind. Fil. 284. 1905.

Rhizome decumbent to erect, succulent-woody, the apex bearing large, lance-attenuate, light brown, glabrous scales, the whole apex (including scales) covered with copious gelatinous mucilage when living; stipes stout, to 1.2 m. long, purplish-brown, minutely glandular-puberulous and bearing scattered thin, brownish scales. Blades oblong, 1–2.8 m. long, 50–90 cm. broad, truncate at base; rhachis minutely stipitate-glandular and sparsely puberulous (as are the costae beneath); pinnae ligulate-caudate, deeply pinnatifid with acute sinuses, each subtended at base by a stout, brown, horny aerophore; costae densely pubescent on upper side; segments liguliform, 15–22 mm. long, 3–4 mm. broad, the margins densely ciliate, and each subtended by a linear brown aerophore; tissue densely resinous-glandular beneath, sparsely hirtellous above, the veins 25–50 pairs per segment. Sori confluent at maturity, forming a dense inframedial line. Sporangia glabrous.

General Distribution: Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: Saba, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Shady banks, wet forest slopes, and moist ravines and gullies at middle to higher elevations.

In his revised classification of subg. *Amauropelta* (1974), A. R. Smith excludes this species partly on the basis of the truncate base of the blade and the different chromosome count. Otherwise, it should be noted that nearly all the characters of *Thelypteris decussata* can be found in one species or another of subg. *Amauropelta*. It is accepted that this species does not belong in subg. *Amauropelta* as defined by Smith; however, I am unwilling to place it more precisely at the present time. Probably subg. *Glaphyropteris* will have to be revived to accommodate it. Meanwhile, in the present treatment, *T. decussata* is placed at the end of subg. *Amauropelta*, as this seems as good a place as any.

Subgenus CYCLOSORUS

KEY TO THE SPECIES

a. A cartilaginous keel or raised pseudovein present, extending from each sinus all or at least part way to the costa; rhizome aways creeping.

b. A small conical aerophore at base of each pinna beneath; lowermost pinnae not much shorter than the middle ones.

c. Rhizome slender (3–5 mm. thick), bearing pubescent scales; veins mostly 7–8 pairs per segment; indusium large, persistent .... 17. *T. clypeolutata*

c. Rhizome thick, woody (10–15 mm. thick), bearing glabrous scales; veins mostly 12–16 pairs per segment; indusium apparently lacking .... 18. *T. glandulosa*

b. Aerophores lacking; blade abruptly contracted below the middle to 8–13 pairs of small auriculiform pinnae .... 19. *T. deltoidea*

a. A cartilaginous keel not present between sinus and costa (do not confuse with excurrent veinlets from fused veins).

d. Costae and veins beneath bearing numerous minute sulphur-yellow glands .... 20. *T. extensa*

d. Costae and veins lacking minute sulphur-yellow glands.

e. Basal veins connivent at or below the sinus, not truly joined or fused in the tissue.

f. Rhizome erect; scales glabrous or pubescent.

g. Blade truncate at base or nearly so .... 21. *T. patens*

g. Blade narrowed below .... 24b. *T. quadrangularis* var. *inconstans*

f. Rhizome horizontal to wide-creeping, bearing pubescent scales.

h. Fronds rather closely distichous; most pinnae with enlarged basal segments, especially the lowest ones; tissue whitish-pilose beneath; indusium conspicuously hairy .. 22. *T. normalis*

h. Fronds distantly attached to the wide-creeping rhizome; pinnae with reduced basal segments, especially the lowest ones; tissue nearly or quite glabrous beneath, minutely puberulous on veins; indusium glabrous or nearly so .... 23. *T. grandis*

e. Basal veins of adjacent segments truly joined in the tissue, with an excurrent veinlet leading from the junction toward the sinus.

i. Rhizome short-creeping or ascending to erect, the fronds close; scales numerous at apex; lowermost pinnae more or less reduced; indusium pubescent.

j. Rhizome suberect to erect, usually 1.5–3 cm. thick including stipe bases; fronds fasciculate; costae beneath with most hairs 3–5 mm. long or more; stipes usually straw-colored .... 24a. *T. quadrangularis* var. *quadrangularis*

j. Rhizome short-creeping, ca. 0.6 cm. thick, the fronds closely distichous; costae beneath with most hairs 1–2 mm. long or less; stipes usually purplish .... 25. *T. dentata*

i. Rhizome wide-creeping, black, almost naked, 2–5 mm. thick; fronds rather distant; pinnae not reduced at base; indusium glabrous or nearly so .... 26. *T. interrupta*

17. **Thelypteris clypeolutata** (Desvaux) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Nephrodium clypeolutatum* Desvaux in Mém. Soc. Linn. Paris **6**: 258. 1827.

Type: Collector not stated, ex *Herb. Desvaux*, found "in Antillis" (P). Desvaux stated that his specimen came from Jamaica, but this was clearly an error.

Syn.: *? Nephrodium oppositum* Fée, Mém. Fam. Foug. **8**: 108. 1857. (Type from Martinique.)

Aspidium l'herminieri Kunze ex Mettenius in Abh. Senck. Nat. Ges. Frankfurt **2**: 85, *no. 285*. 1858. (Type from Guadeloupe.)

Aspidium capitainii Fée & L'Herminier in Fée, Mém. Fam. Foug. **11**: 80, *t. 22, fig. 3*. 1866. (Type from Guadeloupe.)

Aspidium asperulum Fée, Mém. Fam. Foug. **11**: 80, *t. 23, fig. 1*. 1866. (Type from Guadeloupe.)

Aspidium trichophorum Fée, Mém. Fam. Foug. **11**: 81, *t. 23, fig. 2*. 1866. (Type from Guadeloupe.)

Nephrodium trichophorum (Fée) Baker in Hook. & Baker, Syn. Fil. 265. 1867.

Dryopteris trichophora (Fée) Kuntze, Rev. Gen. Pl. **2**: 814. 1891.

Nephrodium holmei Baker in Ann. Bot. **5**: 317. 1891. (Type from Montserrat.)

Dryopteris holmei (Baker) C. Chr., Ind. Fil. 271. 1905.

Dryopteris l'herminieri (Kunze ex Mettenius) C. Chr., Ind. Fil. 275. 1905.

Dryopteris clypeolutata (Desvaux) Weatherby in Contr. Gray Herb. **114**: 28. 1936.

Rhizome densely clothed toward the apex with lance-attenuate, brown, pubescent or glandular-puberulous scales. Fronds distant; stipes 15–25 cm. long, often finely pubescent throughout, scaly toward base. Blades ovate-lanceolate, 25–40 cm. long, 10–15 cm. broad, acuminate-attenuate at apex, slightly narrowed and truncate at base; rhachis and costae on both sides (and the costules beneath) densely villous with short unicellular and long pluricellular hairs; pinnae oblong-acuminate, pinnatifid; segments oblong-subfalcate, ca. 4 mm. broad at base, the veins chiefly 7–8 pairs per segment, simple. Sori supramedial; indusium large, persistent, glabrous or pubescent. Sporangia glabrous.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Moist forests at middle to higher elevations; plants frequent or common.

This and the following two species are sometimes classified in a subg. *Steiropteris*. A. R. Smith (1971) has called this group a "pivotal" one for which a satisfactory classification has not yet been attained. In the present context, it seems best to associate these species with *Cyclosorus*.

18. **Thelypteris glandulosa** (Desvaux) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Polypodium glandulosum* Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 317. 1811.
Type: Collector not stated, ex *Herb. Desvaux*, from the West Indies without exact locality (P).
Syn.: *Goniopteris rostrata* Fée, Mém. Fam. Foug. **11**: 64, *t. 17, fig. 3.* 1866. (Type from Guadeloupe.)
Nephrodium grayii Jenman, Ferns Br. W. Ind. & Guiana 235. 1908. (Type from St. Lucia.)
Nephrodium brachyodon sensu Jenman, Ferns Br. W. Ind. & Guiana 235. 1908, in part (excl. ref. Jamaica), not Hook., 1862 (except for W. Ind. ref.); not *Polypodium brachyodus* Kunze, 1834.
Dryopteris glandulosa (Desvaux) C. Chr. in Dansk. Vid. Selsk. Skr. VII, **10**: 171. 1913, not Kuntze, 1891.

Apex of rhizome densely clothed with very small, ovate, brown, glabrous, subclathrate scales, these quickly deciduous, the rhizome thus appearing to lack scales; stipes to at least 60 cm. long, deeply grooved, glabrous. Blades ovate-oblong, to 1 m. long and to 40 cm. broad, the apex acuminate and hastate-pinnatifid; rhachis, costae, and costules minutely puberulous beneath; pinnae 8–20 pairs, opposite or subopposite, lance-attenuate, to 4 cm. broad, lobed nearly halfway to the costa, the lobes broadly oblong-falcate, ca. 6 mm. broad at the base; tissue of stiff papery texture, the veins mostly 12–16 pairs to each lobe, the lowest ones often arising from the costa (instead of the costule), and several pairs joined in the tissue. Sori small, medial or inframedial. Sporangia glabrous.

GENERAL DISTRIBUTION: Tobago, Trinidad, Guyana; a closely related form occurs in Central America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Wet rocky banks at chiefly middle elevations.

19. **Thelypteris deltoidea** (Sw.) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 59. 1953.

Basionym: *Polypodium deltoideum* Sw., Prodr. 133. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Aspidium deltoideum* (Sw.) Sw. in J. Bot. Schrader **1800**(2): 34. 1801.

Polypodium appendiculatum Poiret in Lam., Encycl. Méth. Bot. 5: 523. 1804.
Nephrodium deltoideum (Sw.) Desvaux in Mém. Soc. Linn. Paris 6: 259. 1827.
Lastrea deltoidea (Sw.) T. Moore, Ind. Fil. 89. 1858.
Dryopteris deltoidea (Sw.) Kuntze, Rev. Gen. Pl. 2: 812. 1891.

Rhizome creeping or ascending, 4–5 mm. thick, densely clothed with old stipe bases, bearing at apex numerous lance-attenuate, sparsely ciliate scales. Fronds clustered, erect; stipes 4–13 cm. long, much shorter than the blades, grooved, glabrous. Blades 25–65 cm. long, with a linear lower portion 10–30 cm. long, abruptly expanded above to an oblong, ovate, or deltate apical portion 15–40 cm. long, 10–25 cm. broad, the apex abruptly acuminate-attenuate, pinnatifid; rhachis densely short-puberulous and hirsute, at least toward the apex; larger pinnae narrowly oblong, 1.5–3 cm. broad, obliquely lobed more than halfway to the costa; segments broadly oblong, subfalcate, 4–6 mm. broad, acute, entire, very close; tissue dark green, the veins 8–12 pairs, simple, prominulous, together with the costules strigose-setulose beneath. Sori supramedial; indusium dark brown, short-pubescent, soon withering.

General Distribution: Greater Antilles, St. Thomas; reported from Trinidad, probably in error.

Distribution in Lesser Antilles: Guadeloupe (?); Martinique, *Plée 465* (p).

Habitat: Wooded hillsides and thickets along streams at middle elevations; this species is very rare in the Lesser Antilles, where its occurrence needs further confirmation.

20. Thelypteris extensa (Blume) Morton in Amer. Fern J. 49: 113. 1959.

Basionym: *Aspidium extensum* Blume, Enum. Pl. Jav. 156. 1828.
Type: Collector not cited, from Penang Island, Malaya.
Syn.: *Nephrodium extensum* (Blume) T. Moore, Ind. Fil. 91. 1858.
Dryopteris extensa (Blume) Kuntze, Rev. Gen. Pl. 2: 812. 1891.
Cyclosorus extensus (Blume) Ching in Bull. Fan Mem. Inst. Biol., Bot. 8: 182. 1938.

Rhizome creeping, clothed toward the apex with dark brown, lance-attenuate, ciliate scales. Fronds slightly dimorphic, the fertile ones more erect and with narrower pinnae; stipes usually 50–70 cm. long, often dark purple-brown toward the base, minutely glandular-puberulous. Blades mostly 50–90 cm. long, 25–50 cm. broad, ovate or ovate-oblong, abruptly long-acuminate at the apex, scarcely reduced at base, all parts clothed with very minute, colorless, stipitate glands; pinnae mostly 15–25 pairs, alternate, to 30 cm. long and chiefly 1.5–2.5 cm. broad, the apex acuminate-falcate; segments oblong-falcate, the fertile ones with revolute margins; vascular parts densely strigillose above, less so beneath, the veins 7–9 pairs, simple, the lowest pair either free, connivent, or joined. Sori inframarginal, impressed; indusium glandular. Sporangia glabrous but with glandular stalks.

General Distribution: Widespread in southeastern Asia and Indonesia; naturalized in Trinidad, Tobago, and Jamaica.

Distribution in Lesser Antilles: Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Shaded banks and gullies at lower to middle elevations; plants becoming increasingly common.

It is possible that the earliest name for this species is *Nephrodium impressum* Desvaux (1827), based on material from Timor. Until this has been confirmed by reference to Desvaux's authentic specimen, it is better to retain the well known epithet *extensa* for this species.

21. **Thelypteris patens** (Sw.) Small, Ferns of the Southeastern States 243. 1938.

Basionym: *Polypodium patens* Sw., Prodr. 133. 1788.
Lectotype: Swartz, from Jamaica (S–PA; isotype, *Herb. Willd. 19773* (B)) (designated by A. R. Smith, 1971).
Syn.: *Polystichum patens* (Sw.) Bernh. in J. Bot. Schrader **1799**(1): 298. 1799.
Aspidium patens (Sw.) Sw. in J. Bot. Schrader **1800**(2): 34. 1801.
Polypodium arcuatum Poiret in Lam., Encycl. Méth. Bot. **5**: 528. 1804. (Type from Grenada.)
Aspidium stipulare Willd. in L., Sp. Pl. **5**: 239. 1810. (Type from Martinique.)
Aspidium arcuatum (Poiret) Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 321. 1811.
Aspidium macrourum Kaulf. in Flora (Regensburg) **6**: 365. 1823. (Type from Martinique.)
Nephrodium stipulare (Willd.) Desvaux in Mém. Soc. Linn. Paris **6**: 256. 1827.
Nephrodium arcuatum (Poiret) Desvaux in Mém. Soc. Linn. Paris **6**: 257. 1827.
Nephrodium patens (Sw.) Desvaux in Mém. Soc. Linn. Paris **6**: 258. 1827.
Nephrodium macrourum (Kaulf.) Schott, Gen. Fil. *ad t. 10*. 1834.
Lastrea patens (Sw.) C. Presl, Tent. Pter. 75. 1836.
Lastrea macroura (Kaulf.) C. Presl, Tent. Pter. 75. 1836.
Lastrea angustata C. Presl, Tent. Pter. 75. 1836. (Based on *Aspidium macrourum* Kaulf.)
Lastrea kohautiana C. Presl, Tent. Pter. 76. 1836, nomen nudum (based on *Polypodium subincisum* Sieber, ined., not Willd. in L., 1810). (Type: *Kohaut, Sieber Fl. Mart. n. 354*, which is also the type of *Aspidium macrourum* Kaulf., from Martinique.)
? *Aspidium pauper* Fée, Mém. Fam. Foug. **8**: 103. 1857. (Type from Martinique.)
? *Lastrea pauperis* (Fée) T. Moore, Ind. Fil. 99. 1858.

Dryopteris patens (Sw.) Kuntze, Rev. Gen. Pl. **2:** 813. 1891.
Dryopteris macroura (Kaulf.) Kuntze, Rev. Gen. Pl. **2:** 813. 1891.
Dryopteris stipularis (Willd.) Maxon ex L. M. Underw. in Bull. Torrey Bot. Club **33:** 198. 1906.
Filix patens (Sw.) Farwell in Ann. Rep. Mich. Acad. Sci. **18:** 82. 1916.
Filix-mas patens (Sw.) Farwell in Amer. Midl. Nat. **12:** 256. 1931.
Cyclosorus arcuatus (Poiret) Alston in Amer. Fern J. **45:** 119. 1955.

The above synonymy is far from complete, as nearly all the specific epithets listed above have been used in various infraspecific categories under several generic names by different authors. It is just our bad luck that all these names (except *patens*) have been based on Lesser Antillean types.

Rhizome stout, erect, concealed by the clustered persistent stipe bases; stipes 20–70 cm. long, deciduously puberulous or glabrate. Blades oblong or narrowly ovate-oblong, 40–120 cm. long, 15–45 cm. broad, truncate or very slightly narrowed at base, the lowest pair of pinnae usually deflexed at an angle oblique to the plane of the blade, the whole underside minutely glandular and more or less whitish-pubescent; pinnae linear-attenuate, 1–2.5(–3) cm. broad, obliquely pinnatifid; segments oblong to linear-oblong, usually somewhat falcate, the basal pair often enlarged, the acroscopic ones with incised margins, the veins 8–15 pairs per segment, simple. Sori slightly supramedial; indusium pale brown, pubescent, persistent. Sporangia glabrous.

Two varieties of this rather polymorphic species occur in the Lesser Antilles. These can be differentiated as follows:

a. Scales on rhizome apex and stipe bases glabrous or essentially so, ovate to ovate-lanceolate, usually light brown, not lustrous; veins and costae glabrous on upper side, or occasionally with very sparse, minute hairs at the base of the costules . . . . 21a. var. *patens*
a. Scales on rhizome apex and stipe bases sparsely to rather densely hairy, the scales ovate-lanceolate to lanceolate, castaneous, lustrous; costules and sometimes the veins above with long stiff hairs . . . . 21b. var. *scabriuscula*

21a. Thelypteris patens var. patens

General Distribution: Florida, Greater Antilles, Trinidad, continental tropical America from Mexico to Argentina.

Distribution in Lesser Antilles: Antigua, Montserrat, Guadeloupe, Dominica, Martinique, Grenada, Barbados.

Habitat: Forest borders and moist, partly shaded situations along roadsides and gullies at lower to middle elevations.

21b. Thelypteris patens var. scabriuscula (C. Presl) A. R. Smith in Univ. Calif. Publ. Bot. 59: 76. 1971.

Basionym: *Lastrea scabriuscula* C. Presl, Epim. Bot. 35. 1849.
Lectotype: *Mikan*, from Brazil (selected by Christensen, 1913). Presl's other syntype was *Breutel*, from St. Kitts.
Syn.: *Aspidium scabriusculum* (C. Presl) Salomon, Salom. Nom. 69. 1883.

Dryopteris patens var. *scabriuscula* (C. Presl) C. Chr. in Dansk. Vid. Selsk. Skr. VII, **10**: 179. 1913.
Dryopteris patens f. *scabriuscula* (C. Presl) Bonaparte, Notes Pter. **2**: 130. 1915.

General Distribution: Greater Antilles, Trinidad, continental tropical America from El Salvador to northwestern Argentina and Peru; common in Colombia and Venezuela.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: Same as for var. *patens*.

A. R. Smith has pointed out (1971) that the application of the epithet *scabriuscula* to this variety may not be correct. He also noted certain similarities between this variety and the next species, *Thelypteris normalis*, both of which have similar rhizome scales, and suggests that var. *scabriuscula* "is a critical taxon needing more study."

22. **Thelypteris normalis** (C. Chr.) Moxley in Bull. South Calif. Acad. 19: 57. 1920.

Basionym: *Dryopteris normalis* C. Chr. in Ark. för Bot. **9**(11): 31. 1910.
Lectotype: *Jenman ?*, from Jamaica (NY).
Syn.: *Nephrodium patens* sensu Jenman in Bull. Bot. Dept. Jamaica II, **3**: 165. 1896; Ferns Br. W. Ind. & Guiana 240. 1908, not *Polypodium patens* Sw.
Filix-mas augescens var. *normalis* (C. Chr.) Farwell in Amer. Midl. Nat. **12**: 253. 1931.
Thelypteris kunthii sensu Morton in Contr. U. S. Nat. Herb. **38**: 53. 1967, ? not *Nephrodium kunthii* Desvaux, 1827.

Rhizome creeping, 4–8 mm. in diameter, clothed at apex with narrow, pale brown, ciliate and puberulous scales (similar scales on stipe bases). Fronds closely distichous; stipes glabrate to sparsely pubescent, shorter than the blades. Blades lance-oblong to broadly ovate-oblong, up to 60 cm. long or more and 25 cm. broad, the lowest pinnae slightly reduced and often deflexed at an angle to the plane of the blade; vascular parts obliquely hirtellous above, the whole underside whitish-pilose and minutely capitate-glandular; pinnae linear-attenuate, mostly 1–2 cm. broad; segments more or less oblong-falcate, with 8–10 pairs of simple veins. Sori medial, with persistent hairy indusium.

General Distribution: Southeastern United States, Bahamas, Greater Antilles, southeastern Mexico and Central America, a few scattered localities in northern South America.

Distribution in Lesser Antilles: Guadeloupe, *L'Herminier in 1861* (P), *Jenman in 1898* (NY), *Allorge B22* (IJ, P); (?) Dominica, *Hodge 122* (GH, identity not certain); Martinique, *Stehlé 4986* (IJ).

HABITAT: Roadside banks, pasture borders and partly shaded gullies; plants very rare in the Lesser Antilles.

Morton (1967) designated the above L'Herminier collection as lectotype of Fée's *Aspidium germanii* (see synonymy of *Thelypteris quadrangularis*, below), but the specimen does not agree with Fée's illustration.

23. **Thelypteris grandis** A. R. Smith in Univ. Calif. Publ. Bot. **59**: 96. 1971.

Lectotype: *Sherring*, from Jamaica (NY; isotypes K, NY) (as designated by Smith, 1971). This material was the basis of *Nephrodium paucijugum* Jenman.

Syn.: *Nephrodium paucijugum* Jenman in J. Bot. **24**: 270. 1886, not *Thelypteris paucijuga* (Klotzsch) A. R. Smith, 1971.
Dryopteris chartacea C. Chr., Ind. Fil. 257. 1905, nom. illegit.

Rhizome ca. 1 cm. in diameter, with stipe bases 4–8 cm. apart. Fronds arching; stipes to 1.5 m. long, quadrangular, nearly glabrous. Blades oblong, to 1.5 m. long and 90 cm. broad, truncate at base, the apex hastate-pinnatifid and abruptly acuminate; rhachis minutely puberulous; pinnae numerous, linear-attenuate, 2–4 cm. broad, deeply pinnatifid, the basal or several lowest pairs excavate at base on basiscopic side due to suppression of one or more segments; segments linear-falcate, acute, 3–5 mm. broad at base, the veins 12–25 pairs per segment, very oblique. Sori medial; indusium large, usually glabrous, pale reddish, persistent. Sporangia glabrous.

GENERAL DISTRIBUTION: Greater Antilles. Several varieties also occur in continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts.

HABITAT: Thickets, forest borders, and moist gullies at lower to middle elevations; plants not common.

24. **Thelypteris quadrangularis** (Fée) Schelpe in J. South Afr. Bot. **30**: 196. 1964.

Basionym: *Nephrodium quadrangulare* Fée, Mém. Fam. Foug. **5**: 308. 1852.
Type: *Leprieur 182*, from French Guiana (NY, isotype).

Syn.: ? *Aspidium germanii* L'Herminier ex Fée, Mém. Fam. Foug. **11**: 82, *t. 22*, *fig. 3*. 1866. (Type from Guadeloupe.) Morton has designated a L'Herminier specimen at Paris as lectotype for *Aspidium germanii*. However, I have seen this specimen and believe it to represent *Thelypteris normalis*. Therefore, A. R. Smith's assignment of *A. germanii* to the synonymy of *Thelypteris quadrangularis*, as followed here, may be open to question, especially since Morton's designated lectotype does not agree with Fée's illustration.
Dryopteris quadrangularis (Fée) Alston ex Box & Alston in J. Bot. **75**: 253. 1937.
Cyclosorus quadrangularis (Fée) Tardieu-Blot in Not. Syst. (Paris) **14**: 345. 1953.

Rhizome apex and stipe bases covered with linear-lanceolate, lustrous, dark brown to castaneous scales mostly 3–6(–8) mm. long and less than 0.7 mm. wide, minutely hairy on the margins and often on the surface; stipes straw-colored, sometimes darkened at the base, mostly 10–40 cm. long, pubescent. Blades oblong-elliptic or oblanceolate, 18–55(–75) cm. long, 7–32 cm. broad, tapering evenly to the short-pinnatifid apex; largest pinnae 3.5–16 cm. long, mostly 0.8–2 cm. broad (excluding basal segments), sessile, incised more than halfway to the costa; segments oblong, slightly oblique or sometimes subfalcate, mostly ca. 3 mm. broad, the veins mostly 5–9 pairs per segment, simple except in enlarged basal segments. Sori about medial; indusium densely pubescent. Sporangia glabrous but their stalks bearing minute stipitate glands.

Two varieties of this variable species are attributed to the Lesser Antilles. These can usually be distinguished as follows:

a. Basal veins of adjacent segments united below the sinus, giving forth an excurrent veinlet leading to the sinus.
  b. Fronds usually more than 60 cm. long; blade less than 2 times as long as the stipe, with only 1–2 pairs of slightly reduced pinnae; tissue usually hairy on the upper side .... 24a. var. *quadrangularis*
  b. Fronds usually less than 60 cm. long; blade 2–4 times as long as the stipe, the pinnae gradually reduced below; tissue usually lacking hairs on the upper side .... 24b. var. *inconstans*
a. Basal veins of adjacent segments free or connivent at or near the sinus .. .. 24b. var. *inconstans*

24a. Thelypteris quadrangularis var. quadrangularis

General Distribution: Greater Antilles except Puerto Rico; Tobago, Trinidad, continental tropical America from Mexico to Bolivia; also recorded from tropical Africa. Other varieties also occur in various areas.

Distribution in Lesser Antilles: Antigua, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist shaded banks and hillsides at lower to middle elevations.

24b. Thelypteris quadrangularis var. inconstans (C. Chr.) A. R. Smith in Univ. Calif. Publ. Bot. 59: 66. 1971.

Basionym: *Dryopteris dentata* var. *inconstans* C. Chr. in Kongl. Sv. Vet. Akad. Handl. 16(2): 27. 1936.

Lectotype: *Ekman 10524*, from Dame Marie, Haiti (s; isotype us) (as selected by A. R. Smith, 1971).

Syn.: *Nephrodium grenadense* Jenman in Gard. Chron. II, 15: 198. 1894. (Type from Grenada.)
Dryopteris grenadense (Jenman) C. Chr., Ind. Fil. 299. 1905.

General Distribution: Greater Antilles.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Martinique, St. Vincent, Grenada.

Habitat: Similar to that of var. *quadrangularis*.

25. **Thelypteris dentata** (Forssk.) E. St. John in Amer. Fern J. **26**: 44. 1936.

Basionym: *Polypodium dentatum* Forssk., Fl. Aegypt.-Arab. 185. 1775.
Type: *Forsskål, Herb. Forssk. 809*, from Yemen (c).
Syn.: *Polypodium molle* Jacq., Coll. Bot. **3**: 188. 1789, not Schreb., 1771, nor All., 1785.
Aspidium molle Sw. in J. Bot. Schrader **1800**(2): 34. 1801.
Nephrodium molle (Sw.) R. Br., Prodr. Fl. N. Holl. 149. 1810, with regard to name.
Polystichum molle (Sw.) Gaud., Freyc. Voy. Bot. 326. 1827.
? *Nephrodium molle* var. *mollissimum* Fée, Mém. Fam. Foug. **11**: 89. 1866.
Hemestheum molle (Sw.) Gandog., Fl. Eur. **27**: 178. 1891.
Dryopteris mollis (Sw.) Hieron. in Hedwigia **46**: 348. 1907.
Dryopteris parasitica sensu Boldingh, Fl. Ned. W. Ind. 95. 1913, in part, not *Polypodium parasiticum* L., 1753.
Dryopteris dentata (Forssk.) C. Chr. in Dansk. Vid. Selsk. Skr. VIII, **6**: 24. 1920.
Nephrodium dentatum (Forssk.) Kümm., Magyar. Bot. Lapok. **32**: 60. 1933.
Cyclosorus dentatus (Forssk.) Ching in Bull. Fan Mem. Inst. Biol., Bot. **8**: 206. 1938.

Rhizome short-creeping, ca. 6 mm. thick, the stipe bases closely distichous; stipes 15–45 cm. long, scaly at base, the scales linear-lanceolate, dark lustrous brown, hairy on the margin and often on the surfaces. Fronds slightly dimorphic, the fertile ones a little taller and with narrower pinnae than the sterile. Blades mostly 40–90 cm. long, 14–34 cm. broad, tapering evenly toward the pinnatifid apex, the lower 2–6 pairs of pinnae reduced; rhachis pubescent, without scales; largest pinnae 7–17 cm. long, 1.1–2.7 cm. wide, the lobes cut more than halfway to the costa; segments oblong or oblong-subfalcate, 2–4 mm. broad, with 6–10 pairs of simple veins per segment, and glands nearly always lacking from both surfaces of the blade. Sori about medial; indusium pubescent but usually lacking glands. Sporangia glabrous but their stalks bearing orange-stipitate glands.

General Distribution: Pantropical. It has been suggested that this rather weedy species is not indigenous to the American tropics, but was somehow introduced to this area in comparatively recent time, and has since become widely naturalized. In support of this theory, A. R. Smith (1971) has implied that no specimen was collected in the Western Hemisphere before 1904. The 1904 record was from Mobile, Alabama.

Distribution in Lesser Antilles: Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Roadside banks, borders of thickets and pastures, and other somewhat moist, disturbed habitats at lower to middle elevations.

26. **Thelypteris interrupta** (Willd.) Iwatsuki in J. Jap. Bot. 38: 314. 1963.

Basionym: *Pteris interrupta* Willd., Phyt. 13, *t. 10, fig. 1.* 1794.
Type: *D. Klein, Herb. Willd. 19770*, from India (B).
Syn.: *Polypodium tottum* Thunb., Prodr. Fl. Cap. 172. 1800.
Aspidium gongylodes Schkuhr, Krypt. Gew. 1: 193, *t. 33c.* 1809. (Published as "*goggilodus*," a name which is here considered an orthographic error.)
Cyclosorus gongylodes (Schkuhr) Link, Hort. Berol. 2: 128. 1833.
Nephrodium gongylodes (Schkuhr) Schott, Gen. Fil. *ad t. 10.* 1834.
Dryopteris gongylodes (Schkuhr) Kuntze, Rev. Gen. Pl. 2: 811. 1891.
Cyclosorus interruptus (Willd.) H. Ito in Bot. Mag. Tokyo 51: 714. 1937.
Thelypteris gongylodes (Schkuhr) Small, Ferns of the Southeastern States 248. 1938.
Thelypteris totta (Thunb.) Schelpe in J. South Afr. Bot. 29: 91. 1963.
Cyclosorus tottus (Thunb.) Pichi-Serm. in Webbia 23: 173. 1968.

The above synonymy is very far from complete. In particular, it should be pointed out that various populations of this species show considerable differences in amount of pubescence from glabrous to rather densely clothed with hairs. The extremes have therefore received the varietal epithets "*glabra*" and "*hirsuta*" in various combinations; in addition, several species names have been given to forms differing in hairiness, glandularity, and other details. None of these names have been included in the synonymy given here. For the purposes of the present work, the view is taken that the glabrous and pubescent extremes of this species are connected by so many intermediate forms that separation on the basis of pubescence alone is without much merit. Incidentally, the type specimens of *T. interrupta* represent one of the pubescent forms.

Rhizome wide-branching, bearing a few scattered, lanceolate, dark purple-brown, sparsely ciliate scales. Fronds often rigidly erect; stipes glabrous and naked, to 75 cm. long or more. Blades broadly linear to oblong, to 1 m. long and 45 cm. broad (often much smaller), abruptly acuminate at the apex, glabrous or nearly so on the upper side, beneath varying from nearly glabrous to somewhat densely pubescent, especially on the costae, which also bear a few small, pale brown scales; costules usually minutely glandular beneath, the glands reddish-resinous and globular to clavate; pinnae linear with bluntly acuminate apex, 5–15 mm. broad; lobed less than halfway to the costa, the lobes deltate to rounded, the veins 7–15 pairs. Sori often becoming confluent at maturity; indusium pubescent. Sporangia glabrous, often with reddish glands.

General Distribution: Pantropical.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Marie Galante, Martinique.

Habitat: Boggy ponds, swamps, and stream banks at low to high elevations.

Subgenus GONIOPTERIS

Key to the Species

- a. Blades narrowed to a pinnatifid apex, the apex thus more or less confluent with the uppermost lateral divisions.
  - b. Blades pinnatifid or merely lobed, usually narrowed toward the base where a few small separate segments or pinnae occur . . . . 27. *T. guadalupensis*
  - b. Blades fully pinnate (except near apex), the pinnae lobed or pinnatifid.
    - c. Pinnae less than 4 cm. long and 1 cm. broad, blunt or rounded at the apex . . . . 28. *T. reptans* var. *tenera*
    - c. Pinnae (of mature plants) more than 5 cm. long and 1 cm. broad, usually acute or acuminate at the apex.
      - d. Margins of pinnae merely crenate (incised not more than 1/8 to the costa); pinnae 4–10 pairs . . . . 29. *T. hastata*
      - d. Margins of pinnae deeply lobed (incised at least 1/3 to the costa); pinnae usually more than 10 pairs (occasionally less).
        - e. Upper surface of blade glabrous (hairs only on costae and veins).
          - f. Pinnatifid apex of blade mostly 10–20 cm. long; pinnae usually not more than 1.5 cm. broad . . 30. *T. leptocladia*
          - f. Pinnatifid apex of blade ca. 5 cm. long; lower pinnae to 3 cm. broad . . . . 31. *T. abrupta*
        - e. Upper surface of blade with numerous minute stellate hairs (similar hairs also beneath) . . . . 33. *T. nephrodioides*
- a. Blades with a distinct terminal pinna resembling the lateral ones.
  - g. Pinnae 6–18 pairs, more or less deeply lobed; blades with numerous stellate hairs beneath, at least on the vascular parts.
    - h. Sporangia setose; nonvascular tissue glabrous (lacking minute stellate hairs) . . . . 32. *T. tetragona*
    - h. Sporangia glabrous; nonvascular tissue (at least beneath) with numerous minute stellate hairs.
      - i. Pinnae mostly 1.5–2.5 cm. broad, in usually more than 12 pairs; stellate hairs on both surfaces of the blade . . 33. *T. nephrodioides*
      - i. Pinnae mostly 2.5–6 cm. broad, in usually less than 10 pairs; upper surface of the blade nearly or quite glabrous . . . . 34. *T. pennata*
  - g. Pinnae 2–5 pairs, the margins entire or crenate; blades without stellate hairs except on the rhachis, just above the insertion of each pinna, otherwise clothed with numerous long, simple hairs; 2–4 pairs of adjacent veins joined in the tissue . . . . 35. *T. poiteana*

27. **Thelypteris guadalupensis** (Wikstr.) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 60. 1953.

Basionym: *Polypodium guadalupense* Wikstr. in Kongl. Sv. Vet. Akad. Handl. **1825**: 435. 1826.

Type: *Forsström*, from Guadeloupe.

Syn.: *Polypodium scolopendrioides* L., Sp. Pl. ed. 2, **2**: 1585. 1763, not L., 1753.

Polypodium domingense Sprengel in L., Syst. Veg. **4**: 51. 1827.

Goniopteris scolopendrioides (L.) C. Presl, Tent. Pter. 182. 1836.

Aspidium scolopendrioides (L.) Mettenius in Abh. Senck. Nat. Ges. Frankfurt **2**: 97, *no. 235*. 1858, in part, with regard to var. 2; Griseb., Fl. Br. W. Ind. 694. 1864.

Nephrodium scolopendrioides (L.) Hook., Sp. Fil. **4**: 65. 1862.

Dryopteris scolopendrioides (L.) C. Chr., Ind. Fil. 291. 1905, not Kuntze, 1891.

Dryopteris guadalupensis (Wikstr.) C. Chr. in Biol. Arb. tilegn. Eug. Warming 84. 1911, not Kuntze, 1891.

Dryopteris domingensis (Sprengel) Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 474. 1926.

Cyclosorus guadalupensis (Wikstr.) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10**: 245. 1941.

Rhizome decumbent to nearly erect, bearing an apical tuft of pale brown, lance-attenuate, minutely stellate-puberulous scales. Fronds often or usually dimorphic, the sterile ones short, nearly sessile, and more or less prostrate, the fertile ones stipitate and rigidly erect; stipes of fertile fronds to 15 cm. long, minutely stellate-puberulous. Fertile blades lanceolate, narrowly oblanceolate, or linear-attenuate, 10–40 cm. long, 2–6 cm. broad at or near the middle, pinnate only at the extreme base (1 to several pairs of much reduced, distant pinnae), otherwise lobed or pinnatifid; rhachis stellate-puberulous on both sides, the other vascular parts with stellate hairs beneath only; segments variable, deltate-oblong to linear-oblong, somewhat acute or obtuse, entire to crenate, the veins 8–15 pairs, mosly branched, the basal veinlets joined, forming a series of areoles along the rhachis and costae. Sori inframedial; indusium small or minute, stellate-puberulous. Sporangia glabrous.

General Distribution: Greater Antilles.

Distribution in Lesser Antilles: Guadeloupe, La Desirade, Marie Galante, Martinique.

Habitat: On limestone boulders and ledges in shaded gullies at low elevations.

28. **Thelypteris reptans** (J. F. Gmelin) Morton in Amer. Fern J. **41**: 87. 1951. var. **tenera** (Fée) Proctor in Rhodora **61**: 306. 1959 (1960).

Basionym: *Goniopteris tenera* Fée, Mém. Fam. Foug. **11**: 60, *t. 15, fig. 3.* 1866.

Type: *L'Herminier in 1861*, from Guadeloupe (IJ, isotype).

Syn.: *Nephrodium asplenioides* var. *tenerum* (Fée) Jenman in Bull. Bot. Dept. Jamaica II, **3**: 211. 1896, with regard to name.

Rhizome short, decumbent, bearing numerous light brown, lance-acuminate scales, these densely and minutely stellate-pubescent. Fronds few, ascending, not dimorphic, 15–30 cm. long, with slender straw-colored stipes to 11 cm. long; clothed throughout with numerous minute furcate or 3-branched hairs, a few longer simple hairs also present. Blades narrowly deltate to lance-oblong or linear-oblong, 11–23 cm. long, 4–6 cm. broad at or below the middle, fully pinnate to the pinnatifid, nonproliferous apex; pinnae 8–15 pairs, narrowly deltate-oblong, 6–12 mm. broad at the slightly auriculate base, the lower ones short-stalked (1 mm.), the apex blunt, the margins crenate or shallowly lobed, the veins chiefly 2–3 pairs per segment, simple, the lowest adjacent ones joined in the tissue. Sori inframedial; indusium lacking. Sporangia glabrous.

General Distribution: Puerto Rico (?).

Distribution in Lesser Antilles: St. Kitts, Nevis, Guadeloupe.

Habitat: On sheltered, shaded ledges at middle to higher elevations; plants very rare.

This variety differs from typical *Thelypteris reptans* of the Greater Antilles in never having proliferous fronds, in the absence of an indusial structure (though one or two vestigial hairs are sometimes present), in the tissue hairs mostly being merely forked (a few 3-branched) rather than stellate with 3–5 branches, and in the tendency for the basal stalks to be longer.

29. **Thelypteris hastata** (Fée) Proctor in Bull. Inst. Jamaica Sci. Ser. 5: 60. 1953.

Basionym: *Goniopteris hastata* Fée, Mém. Fam. Foug. **11**: 65, *t. 18, fig. 1.* 1866. (Part of *fig. 1* transposed with part of *fig. 2.*)
Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Nephrodium hastatum* (Fée) Jenman in J. Bot. **17**: 261. 1879.
Dryopteris hastata (Fée) Urban, Symb. Antill. **4**: 21. 1903.

Rhizome short-creeping, the apex bearing thin stellate-pubescent scales. Fronds slightly dimorphic, the fertile more rigidly erect and with longer stipes; stipes of fertile fronds 15–45 cm. long, minutely stellate-pubescent. Blades elliptic to ovate-oblong, 25–40 cm. long, 15–22 cm. broad, abruptly narrowed above to a hastate, lobed, elongate apex, the upper side glabrate, the under side pubescent throughout with simple, furcate, and stellate hairs; pinnae 4–10 pairs, oblong-linear to oblanceolate, 1.5–2 cm. broad, acuminate, the upper ones semiadnate, with margins broadly crenate, and veins about 6 pairs, the lower 2 or 3 pairs united alternately into a flexuous veinlet running to the sinus. Sori in 2 rows between sinus veinlets, inframedial; indusium lacking. Sporangia setulose with minute furcate hairs.

General Distribution: Jamaica, Hispaniola (?), Puerto Rico, Tobago, Trinidad.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

HABITAT: Wooded slopes among limestone rocks at lower elevations; plants rare.

30. **Thelypteris leptocladia** (Fée) Proctor in Bull. Inst. Jamaica Sci. Ser. 5: 61. 1953.

Basionym: *Goniopteris leptocladia* Fée, Mém. Fam. Foug. **11**: 60, *t. 16, fig. 1.* 1866.
Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Aspidium asplenioides* f. *exindusiatum* Kuhn in Engl. Bot. Jahrb. **24**: 119. 1897.
Dryopteris hastata var. *leptocladia* (Fée) C. Chr. in Dansk. Vid. Selsk. Skr. VII, **10**: 230. 1913.
Dryopteris hastata var. *subauriculata* Kuhn ex C. Chr. in Dansk. Vid. Selsk. Skr. VII, **10**: 230. 1913.
Dryopteris leptocladia (Fée) Maxon in Sci. Surv. Porto Rico & Virgin Is. **6**: 476. 1926.

Rhizome decumbent, at apex bearing lance-attenuate, stellate-pubescent scales. Fronds slightly dimorphic; stipes 20–45 cm. long, minutely stellate-pubescent. Blades lanceolate to ovate-oblong, 30–50 cm. long, 15–25 cm. broad, abruptly narrowed to an elongate, nonhastate, pinnatifid or lobed apex; rhachis and costae stellate-pubescent on both sides, the veins with a few furcate or stellate hairs beneath only, simple hairs lacking or nearly so; pinnae 10–17 pairs, linear or narrowly lance-linear, 1–1.5 cm. broad, distinctly lobed, the lobes cut 1/3 or nearly halfway to the costa, rounded-acute, the veins 5–9 pairs, with only the basal pair of adjacent sets united; pinnae usually considerably narrower than those of *T. hastata*, the upper ones somewhat adnate to the rhachis. Sori inframedial; indusium lacking. Sporangia setose with usually stellate or furcate hairs.

GENERAL DISTRIBUTION: Greater Antilles except Cuba.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Marie Galante, Martinique.

HABITAT: Thickets and shady slopes at lower elevations, usually associated with limestone.

Intermediates between this species and *Thelypteris hastata* may be hybrids, or else can be interpreted as indicating that *T. hastata* and *T. leptocladia* represent unlike forms of a single polymorphic species. Further study of these forms is needed.

31. **Thelypteris abrupta** (Desvaux) Proctor in Rhodora 61: 306. 1959 (1960).

Basionym: *Polypodium abruptum* Desvaux in Mém. Soc. Linn. Paris **6**: 293. 1827.
Type: Collector not stated, ex *Herb. Desvaux*, from the West Indies without exact locality (P).

Syn.: *Goniopteris pyramidata* Fée, Mém. Fam. Foug. **11:** 61, *t. 16, fig. 2.* 1866. (Type from Guadeloupe.)
Dryopteris pyramidata (Fée) Maxon in Contr. U. S. Nat. Herb. **10:** 489. 1908.
Cyclosorus pyramidatus (Fée) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10:** 248. 1941.

Rhizome obliquely erect or decumbent, the apex bearing stellate-puberulous scales. Fronds slightly dimorphic, the fertile ones more stiffly erect and longer than the sterile; stipes 15–45 cm. long or more, minutely stellate-puberulous. Blades narrowly deltate-oblong to broadly deltate, 25–35 cm. long, 15–22 cm. broad at the truncate base, distinctly pinnate nearly to the short-acuminate apex; rhachis and costae stellate-puberulous beneath; pinnae 9–11 pairs, lance-oblong to deltate-lanceolate, short-stalked, acuminate, to 3 cm. broad, the lower ones narrowed at base, the upper ones basally truncate, with margins lobed (sinuses cut about 1/3 to the costa), the lobes broadly oblong, truncate or subfalcate, 5–6 mm. broad at base, the veins 7–10 pairs, the basal pair connivent to the sinus or occasionally joined in the tissue. Sori small, medial; indusium small, dark brown, ciliate, persistent. Sporangia with glabrous head and setose stalk.

GENERAL DISTRIBUTION: Hispaniola, Tobago, Trinidad, the Guianas, Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique, St. Vincent, Grenada.

HABITAT: Level ground in thickets and moist forests at middle elevations.

32. **Thelypteris tetragona** (Sw.) Small, Ferns of the Southeastern States 256. 1938.

Basionym: *Polypodium tetragonum* Sw., Prodr. 132. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Polypodium subtetragonum* Link, Hort. Berol. **2:** 105. 1833.
Goniopteris tetragona (Sw.) C. Presl, Tent. Pter. 183. 1836.
Goniopteris feei L'Herminier ex Fée, Mém. Fam. Foug. **11:** 61, *t. 17, fig. 1.* 1866. (Type from Guadeloupe.)
Dryopteris tetragona (Sw.) Urban, Symb. Antill. **4:** 20. 1903, not Kuntze, 1891.
Dryopteris parasitica sensu Boldingh, Fl. Dutch W. Ind. **1:** 2. 1909, in part, not *Polypodium parasiticum* L., 1753.
Dryopteris subtetragona (Link) Maxon in Sci. Surv. Porto Rico & Virgin Is. **6:** 473. 1926.
Thelypteris subtetragona (Link) E. St. John in Amer. Fern J. **26:** 44. 1936.

Rhizome short-creeping, at apex bearing brown, lance-attenuate, minutely furcate-pubescent scales. Fronds somewhat dimorphic, the fertile ones longer, narrower, and more stiffly erect; stipes of fertile fronds to 50 cm. long, minutely puberulous with erect, furcate hairs. Blades ovate-oblong to deltate-oblong, mostly 30–45 cm. long, 10–25 cm. broad; rhachis with minute forked and simple hairs, the other vascular parts on both sides with simple hairs only; pinnae 6–12 pairs, linear-attenuate or linear-oblong, pinnatifid, the fertile ones usually narrower than the sterile; segments oblong or deltate-oblong; tissue glabrous, with 6–10 pairs of simple veins per segment, the lowermost joined and sending an excurrent veinlet to the sinus. Sori inframedial; indusium lacking. Sporangia setulose.

This species is represented in the Lesser Antilles by two quite well marked varieties, one common, the other rare; they can be distinguished as follows:

a. Pinnae mostly 1–3 cm. broad, incised more than halfway to the costa; not more than one pair of adjacent veins joined in the tissue . . . . 32a. var. *tetragona*
a. Pinnae mostly 3–3.5 cm. broad, incised halfway or less to the costa; 2–3 pairs of adjacent veins joined in the tissue . . . . 32b. var. *guadalupensis*

32a. Thelypteris tetragona var. tetragona

General Distribution: Florida, Greater Antilles, Trinidad, continental tropical America from Mexico to Brazil and Ecuador.

Distribution in Lesser Antilles: St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Thickets, wooded banks and hillsides, and rocky forests at lower to middle elevations; plants common.

32b. Thelypteris tetragona var. guadalupensis (Fée) Kramer in Stoffers, Fl. Neth. Ant. 1: 57. 1962.

Basionym: *Goniopteris guadalupensis* Fée, Mém. Fam. Foug. **11**: 64, *t. 17, fig. 2.* 1866.
Type: *L'Herminier in 1961*, from Grande-Terre, Guadeloupe.
Syn.: *Polypodium tetragonum* var. *guadalupense* (Fée) Krug ex Urban in Engl. Bot. Jahrb. **24**: 124. 1897.
Dryopteris tetragona var. *guadalupensis* (Fée) C. Chr. in Dansk. Vid. Selsk. Skr. VII, **10**: 261. 1913.
Dryopteris septemjuga C. Chr. in Kongl. Sv. Vet. Akad. Handl. III, **16**: 32, *t. 7, figs. 4, 5.* 1937. (Type from Haiti.)

General Distribution: Jamaica, Hispaniola, Trinidad.

Distribution in Lesser Antilles: Saba, Guadeloupe, Martinique, St. Vincent, Grenada.

Habitat: In situations similar to those of var. *tetragona*; plants rare.

33. **Thelypteris nephrodioides** (Klotzsch) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 61. 1953.

Basionym: *Aspidium nephrodioides* Klotzsch in Linnaea **20**: 370. 1847.
Type: *Moritz 206*, from Caripe, Venezuela.
Syn.: *Nephrodium guadalupense* Fée, Mém. Fam. Foug. **11**: 89, *t. 24, fig. 3.* 1866. (Type from Guadeloupe.)
Dryopteris guadalupensis (Fée) Kuntze, Rev. Gen. Pl. **2**: 812. 1891.
Aspidium guadalupense (Fée) Christ in Bull. Soc. Bot. Belg. **35**: 210. 1896.
Dryopteris nephrodioides (Klotzsch) Hieron. in Hedwigia **46**: 327. 1907, not Kuntze, 1891.
Dryopteris tetragona sensu Boldingh, Fl. Ned. W. Ind. 96. 1913, in part, not Kuntze, 1891, nor Urban, 1903.
Cyclosorus nephrodioides (Klotzsch) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10**: 247. 1941.

Rhizome oblique, the apex and stipe bases bearing a few minutely stellate-pubescent scales. Fronds not dimorphic; stipes up to 75 cm. long, stellate-puberulous. Blades lance-ovate to ovate-oblong, 30–75 cm. long, 20–50 cm. broad, minutely stellate-puberulous throughout on both sides; pinnae numerous, linear-attenuate, mostly 1.5–2.5 cm. broad, pinnatifid (cut more than halfway to the costa); segments oblong, subfalcate, 3–5 mm. broad, entire; tissue grayish-green, with 9–12 pairs of veins per segment, the basal pair of adjacent segments connivent or joined. Sori medial; indusium stellate-pubescent, persistent. Sporangia glabrous.

General Distribution: Greater Antilles, Trinidad, northern South America.

Distribution in Lesser Antilles: Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent.

Habitat: Shaded ravines and wooded hillsides at lower to middle elevations.

34. **Thelypteris pennata** (Poiret) Morton in Contr. U. S. Nat. Herb. **38**: 64. 1967.

Basionym: *Polypodium pennatum* Poiret in Lam., Encycl. Méth. Bot. **5**: 535. 1804.
Type: Collecter not stated, from "Amer. Merid." (P) (as cited by Morton, 1967).
Syn.: *Polypodium megalodus* Schkuhr, Krypt. Gew. **1**: 24, *t. 19b*. 1804.
Goniopteris megalodus (Schkuhr) C. Presl, Tent. Pter. 182. 1836.
Aspidium megalodus (Schkuhr) Mettenius, Fil. Lechl. **2**: 21. 1859.
Goniopteris quadrangularis Fée, Mém. Fam. Foug. **11**: 63, *t. 16, fig. 3.* 1866.
Dryopteris megalodus (Schkuhr) Urban, Symb. Antill. **4**: 21. 1903.
Thelypteris megalodus (Schkuhr) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 61. 1953.

Rhizome stout, short-creeping, at apex bearing large (to 10 mm. long), lanceolate, castaneous, minutely stellate-pubescent scales; stipes up to 55 cm. long, minutely stellate pubescent throughout. Blades transversely oblong to broadly deltate-oblong, 35–70 cm. long, 30–55 cm. broad; rhachis and other vascular parts densely and minutely stellate-pubescent, especially beneath; pinnae 6–10 pairs, linear-oblong, abruptly acuminate-attenuate, up to 6 cm. broad, lobed nearly halfway to the costa, the lobes falcate, somewhat acute, 7–10 mm. broad at base; tissue dark green, glabrate above (minute stellate hairs very few but always present), sparsely and minutely stellate-pubescent beneath (branches of stellate hairs 0.1–0.3 mm. long), with 10–16 pairs of veins per pinna the basal adjacent pairs united, the next several pairs connivent to a linear sinus membrane. Sori small, medial; indusium minute and stellate-puberulous, or sometimes apparently lacking. Sporangia glabrous.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Venezuela and Ecuador.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Montserrat, Guadeloupe, Dominica (?), Martinique, St. Lucia, St. Vincent.

HABITAT: Wooded rocky hillsides at middle elevations.

35. **Thelypteris poiteana** (Bory) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 63. 1953.

Basionym: *Lastrea poiteana* Bory, Dict. Classique **9**: 233. 1826.
Type: *Poiteau*, from French Guiana.
Syn.: *Polypodium crenatum* Sw., Prodr. 132. 1788, not Forssk., 1775.
Goniopteris crenata (Sw.) C. Presl, Tent. Pter. 183. 1836.
Goniopteris rivoirei Fée, Mém. Fam. Foug. **5**: 253. 1852. (Type from Martinique.)
Phegopteris crenata (Sw.) Mettenius, Fil. Hort. Lips. 84. 1856.
Dryopteris poiteana (Bory) Urban, Symb. Antill. **4**: 20. 1903.
Dryopteris poiteana var. *rivoirei* (Fée) Domin, Pter. Dominica 222. 1929.
Goniopteris poiteana (Bory) Ching in Sunyatsenia **5**: 239. 1940.

Rhizome woody, short-creeping, at the apex bearing lanceolate, brown, furcate-puberulous scales. Fronds few, slightly dimorphic (the fertile ones with longer stipes); stipes 15–45 cm. long, nearly glabrous. Blades oval to broadly deltate-oblong, 20–35 cm. long, 18–30 cm. broad; rhachis with minute furcate hairs above the insertion of the pinnae, otherwise all hairs of the blade simple; pinnae 2–6 pairs, narrowly oblong to elliptic-linear or oblanceolate, abruptly acuminate, 3–6 cm. broad, the margins subentire to coarsely serrate-crenate, the ultimate veins 6–9 pairs, the lower 4–7 adjacent sets united in the tissue. Sori in double rows between costules; indusium lacking. Sporangia glabrous or occasionally setulose.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Guatemala to Peru and Brazil.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: Moist shaded banks, thickets, and shady ravines at lower to middle elevations; plants often occur in shaded situations of cultivated areas, such as groves of cacao, nutmeg, or citrus trees.

This species sometimes bears proliferous buds along the rhachis of sterile fronds.

Doubtful Records

Goniopteris affinis Fée, Mém. Fam. Foug. **5**: 250. 1852. This was described from Guadeloupe on the basis of a specimen collected by Bertero; Fée later (1866) reduced it to synonymy under his *G. scolopendrioides* (= *Thelypteris guadalupensis*). According to material I saw at Paris (probably authentic) this is the same as *Aspidium scolopendrioides* f. *incisum* Duss (*Duss 4389* (P)), and probably represents the hybrid *Thelypteris guadalupensis* × *reptans* var. *tenera*. However, more information is needed to establish its correct status.

Thelypteris scolopendrioides (L.) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 64. 1953. Specimens at Paris determined as *Goniopteris ferax* Fée (Mém. Fam. Foug. **5**: 250. 1852) are a large form of this species, but probably did not originate in the Lesser Antilles. However, Fée cited "Guadeloupe, *L'Herminier*" for *G. ferax* and further investigation may show that *T. scolopendrioides* does in fact occur there.

Subgenus MENISCIUM

Key to the Species

a. Margins of pinnae entire to wavy or lightly crenate.
  b. Pinnae less than 2 cm. broad (the fertile ones ca. 1 cm. broad), with ciliate margins . . . . 36. *T. angustifolia*
  b. Pinnae mostly 2–6 cm. broad, the margins glabrous . . . 37. *T. reticulata*
a. Margins of pinnae sharply serrate, the apical teeth of the serrations often incurved or hooked . . . . 38. *T. serrata*

36. Thelypteris angustifolia (Willd.) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 57. 1953.

Basionym: *Meniscium angustifolium* Willd. in L., Sp. Pl. **5**: 133. 1810.
Type: *Bredemeyer, Herb. Willd. 19574*, from Caracas, Venezuela (B).
Syn.: *Polypodium salicifolium* Vahl, Eclog. Amer. **3**: 51. 1807, not *Thelypteris salicifolia* (Wall. ex Hook.) Reed, 1968. (Type from Montserrat.)

Meniscium acrostichoides Desvaux in Mém. Soc. Linn. Paris **6**: 223. 1827. (Type from St. Thomas, Virgin Islands.)
Phegopteris angustifolia (Willd.) Mettenius, Fil. Lechl. **2**: 22. 1859.
Dryopteris angustifolia (Willd.) Urban, Symb. Antill. **9**: 303. 1925.

Rhizome short-creeping, fleshy, 1–2 cm. thick, scurfy-paleaceous and giving rise to a mass of coarse roots. Fronds slightly dimorphic, the fertile ones taller and more erect than the sterile; stipes stout, finely puberulous. Blades oblong, 15–50 cm. long, 8–28 cm. broad; rhachis flattish, grooved, strigillose-puberulous; pinnae 8–22 pairs and a similar terminal one, lance-linear, 5–16 cm. long, 0.5–2 cm. broad, stalked, attenuate at apex, the margins entire and short-ciliate; costae strigillose-puberulous or glabrate; tissue with numerous veins, these 1.5–2 mm. apart, oblique, the areoles in 3–12 rows, curved-oblong. Sori numerous, close, linear-oblong, becoming confluent and usually covering the surface at maturity.

General Distribution: Greater Antilles, St. Thomas, continental tropical America from Costa Rica to Bolivia.

Distribution in Lesser Antilles: Montserrat.

Habitat: On moist shaded rocks along streams at low to middle elevations; plants very rare.

This species has not been found in the Lesser Antilles since Ryan collected it in Montserrat in approximately 1780. Its present occurrence is therefore somewhat doubtful and needs further confirmation.

37. **Thelypteris reticulata** (L.) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 63. 1953.

Basionym: *Polypodium reticulatum* L., Syst. Nat. ed. 10, **2**: 1325. 1759.
Type: LINN *1251.25*, from an unknown locality, possibly Jamaica. Linnaeus also cited Plumier, Descr. Pl. Amer. *t. 9* (= Tr. Foug. *t. 110*), which illustrates a plant from Morne de la Calebasse, Martinique.
Syn.: *Asplenium sorbifolium* Jacq., Coll. Bot. **2**: 106, *t. 3, fig. 2*. 1788. (Type from Martinique.)
Meniscium sorbifolium (Jacq.) Desr. in Lam., Encycl. Méth. Bot. **4**: 93. 1797.
Meniscium reticulatum (L.) Sw. in J. Bot. Schrader **1801**(2): 274. 1803.
Diplazium undulosum Sw., Syn. Fil. 92, 284. 1806. (Type from Martinique.)
Callipteris undulosa (Sw.) C. Presl, Epim. Bot. 90. 1851.
Phegopteris reticulata (L.) Mettenius, Fil. Lechl. **2**: 24. 1859.
Nephrodium reticulatum (L.) Keys., Pol. Cyath. Herb. Bung. 49. 1873.
Dryopteris reticulata (L.) Urban, Symb. Antill. **4**: 22. 1903.
Dryopteris sorbifolia (Jacq.) Hieron. in Hedwigia **46**: 350. 1907.

Rhizome short-creeping, at apex bearing reddish-brown, lanceolate, glabrous scales with denticulate margins. Fronds erect, somewhat dimorphic, the fertile ones with longer stipes; stipes to 1 m. long, puberulous. Blades deltate-oblong to lance-oblong, 0.5–1.2 m. long, 20–60 cm.

broad, the vascular parts sparsely hirtellous beneath; pinnae ligulate-attenuate to lance-deltate, caudate at apex, 2–6 cm. broad, the base unequally rounded or broadly cuneate, the margins entire, wavy, or slightly crenate, the ultimate veins all joined, forming numerous pairs of areoles between the parallel penultimate veins. Sori linear-arcuate, usually more or less confluent; indusium lacking. Sporangia glabrous or occasionally setulose.

General Distribution: Florida, Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Brazil.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Moist glades and shaded banks, especially along streams, at low to middle elevations.

38. **Thelypteris serrata** (Cav.) Alston in Kew Bull. 1932: 309. 1932.

Basionym: *Meniscium serratum* Cav., Descr. Pl. 548. 1803.
Type: *Guio, Herb. Cav.*, from a plant cultivated in Havana, Cuba (MA).
Syn.: *Phegopteris serrata* (Cav.) Mettenius in Ann. Sci. Nat. Bot. V, 2: 243. 1864.
Nephrodium serratum (Cav.) Keys., Pol. Cyath. Herb. Bung. 49. 1873.
Dryopteris serrata (Cav.) C. Chr., Ind. Fil. 291. 1905.

Rhizome short-creeping, branched, apparently nearly or quite devoid of scales. Fronds slightly dimorphic as in *T. reticulata*; stipes to 50 cm. long or more, stout, glabrate. Blades broadly oblong to deltate-lanceolate, 50–90 cm. long, 15–45 cm. broad, more or less hirtellous beneath, at least on the penultimate veins; pinnae narrowly deltate-lanceolate to linear-attenuate, 1–3.5 cm. broad, the base unequally cuneate, the ultimate veins and sori as in *T. reticulata*. Sporangia always glabrous.

General Distribution: Greater Antilles except Hispaniola; Trinidad, continental tropical America from Mexico to Bolivia and Brazil. This species uncommon throughout its range.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: Swamps, boggy ponds, and wet margins of streams at low to medium elevations; plants rare.

Subfamily ASPLENIOIDEAE

ASPLENIUM Linnaeus

Asplenium L., Sp. Pl. 2: 1078. 1753. Figure 56.

Small to medium-sized, terrestrial, epipetric, or epiphytic ferns. Rhizomes creeping to erect, dictyostelic, bearing clathrate scales. Fronds clustered, not articulate to the rhizome, seldom dimorphic; stipes con-

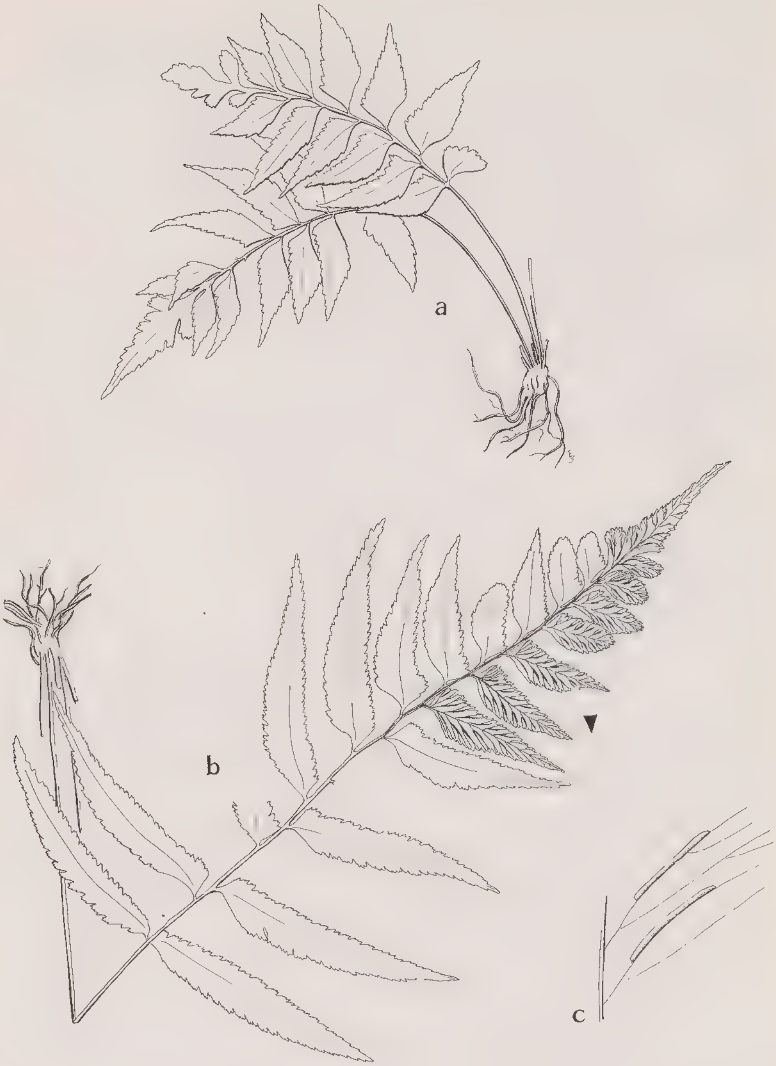

FIGURE 56. **Asplenium.** a–c, *A. abscissum*: a, habit, × 0.4; b, habit, the upper portion of the frond showing venation and sori, × 0.4; c, enlarged area of pinna, the elongate sori borne on the acroscopic vein branches, × 4.0.

taining 2 steles (vascular bundles) in the lower part, but at the top with a single X-shaped stele, formed by the fusion of the two lunate steles at their midpoint. Blades simple or 1- to 4-pinnate, or variously pinnatifid to decompound, anadromous, usually glabrous or nearly so; pinnae often inequilateral, often acroscopically auriculate, with veins usually forked, free (rarely joined), the lower margins of pinnae or pinnules usually decurrent. Sori oval to narrowly linear, borne along the ultimate veins; indusium elongate, membranous, laterally attached, opening acroscopically. Sporangia with slender pedicels; annulus of 20 or more cells; spores bilateral, monolete, smooth or spinulose.

TYPE SPECIES: *Asplenium marinum* L., of European coasts.

A large, cosmopolitan genus of more than 700 species; 17 are here recorded from the Lesser Antilles, of which only one (a putative hybrid) is endemic.

SPECIAL LITERATURE: Morton and Lellinger, The Polypodiaceae subfamily Asplenioideae in Venezuela, in Mem. N. Y. Bot. Gard. **15**: 1–49. 1966.

KEY TO THE SPECIES

a. Blades simple .... 1. *A. serratum*

a. Blades 1- to 3-pinnate.

b. Blades less than 4 cm. broad.

c. Blades of a linear type, glabrous.

d. Rhachis green.

e. Rhizome scales blackish; lateral and terminal pinnae rounded-obtuse; plants growing on limestone boulders and ledges .... 2. *A. trichomanes-dentatum*

e. Rhizome scales yellow-brown; lateral pinnae acute to acuminate; termina pinna lanceolate-elongate; plants growing on mossy tree trunks or logs .... 13. *A. salicifolium*

d. Rhachis dark brown to black.

f. Sori mostly in a single row, confined to the basiscopic side of the pinnae; acroscopic lobules of pinnae mostly bifid; rhizome scales bicolorous .... 3. *A. formosum*

f. Sori forming a double row on each pinna; lobules of pinnae all entire; rhizome scales not bicolorous .... 11. *A. harpeodes*

c. Blades of a detate type, minutely pubescent .... 4. *A. pumilum*

b. Blades more than 4 cm. broad.

g. Pinnae entire to pinnatifid.

h. Blades of a deltate type, minutely pubescent with whitish pluricellular hairs .... 4. *A. pumilum*

h. Blades pinnate, oblong to linear, not pubescent as above.

i. Rhizome creeping, the fronds distichous.

j. Costae fibrillose-scaly; tissue relatively firm and subleathery, lustrous .... 5. *A. serra*

j. Costae not scaly; tissue thin, dull.

k. Stipe and rhachis brown; pinnae in 18–28 pairs, the living tissue relatively opaque; sori less than 5 mm. long .... 6. *A. laetum*

k. Stipe and rhachis dull green; pinnae in 3–7(–15) pairs, the living tissue translucent; sori up to 10 mm. long . . . . 7. *A. obtusifolium*

i. Rhizome erect or ascending, the fronds fasciculate.
  l. Stipe and rhachis broadly winged, the wings 1–2 mm. broad . . . . 8. *A. alatum*
  l. Stipe and rhachis at most very narrowly winged (wings if present less than 1 mm. broad).
    m. Fronds without a flagelliform, rooting tip.
      n. Blades of a linear type, the pinnae in 16–40 pairs.
        o. Rhizome scales strongly clathrate; rhachis dull greenish-brown.
          p. Pinnae 16–20 pairs; veins mostly forked (except the apical ones); rhizome scales less than 4 mm. long . . . . 9. *A. malcolm-smithii*
          p. Pinnae 25–40 pairs; veins mostly simple; rhizome scales to 7 mm. long . . . . 10. *A. pteropus*
        o. Rhizome scales obscurely clathrate; rhachis dark brown or blackish . . . . 11. *A. harpeodes*
      n. Blades of an oblong-deltate type, the pinnae in mostly 5–15 pairs.
        q. Blades ovate-oblong or deltate-oblong, the pinnae in mostly 5–9 pairs; indusium membranous, brownish . . . . 12. *A. abscissum*
        q. Blades narrowly to broadly oblong, the pinnae in mostly 10–15 pairs; indusium firm, whitish to brown.
          r. Pinnae dentate to crenate-serrate . . . . 13. *A. salicifolium*
          r. Pinnae deeply pinnatifid or almost fully pinnate at base . . . . 14. *A. auritum*
    m. Fronds with flagelliform tips, these often rooting; stipe and rhachis shining purple-black . . . . . . 15. *A. radicans*

g. Pinnae 1- to 2-pinnate.
  s. Rhachis green-winged; pinnae alternate, sessile or nearly so . . . . 16. *A. cristatum*
  s. Rhachis not winged; pinnae subopposite, stalked . . . . 17. *A. cuneatum*

1. **Asplenium serratum** L., Sp. Pl. 2: 1079. 1753.

Lectotype: Plumier, Descr. Pl. Amer. *t. 39*, based on material from either Martinique or Hispaniola. Morton & Lellinger (Mem. N. Y. Bot. Gard. **15**: 9. 1966) have selected as "lectotype" a depauperate Sloane specimen from Jamaica. However, this choice is unacceptable, as Linnaeus saw neither the specimen nor any plate drawn from it, but merely cited Sloane's phrase-name. He did not normally base any of his own binomials upon the unsupported phrase-name of another author, and in this case Sloane had published no plate. The Plumier plate, on the other hand, was unquestionably in front of Linnaeus when he drew up his diagnosis. Further, it makes a better lectotype because it is a good representation of the species.

Syn.: *Asplenium crenulatum* C. Presl, Tent. Pter. 106. 1836.
Asplenium lanciforme Fée, Mém. Fam. Foug. **5**: 192. 1852.
Asplenium integrum Fée, Mém. Fam. Foug. **5**: 193. 1852. (Type from Guadeloupe.)
Asplenium serratum var. *lancifolium* Duss, Foug. & Lyc. Antill. Franc. 78. 1903. (Duss attributed the epithet *lancifolium* to Fée, apparently in error; possibly *lanciforme* was intended.)

Rhizome erect, embedded in a dense mass of brownish, hairy roots, and clothed at the apex with a tuft of thin, dark brown, narrowly linear-attenuate scales. Fronds in a rosettelike cluster, stiffly oblique, up to 1 m. long, nearly stipeless. Blades linear-oblanceolate, 7–14 cm. broad, gradually narrowed below, abruptly short-acuminate at the apex, the margins irregular, finely cartilaginous, and dentate or finely crenate-serrate; tissue firmly papery, the veins oblique, parallel, mostly 1-forked near base, bearing elongate, narrowly linear sori. Indusium whitish, firm, entire, glabrous.

General Distribution: Florida, Greater Antilles, St. Thomas, Tobago, Trinidad, continental tropical America from Mexico to Brazil.

Distribution in Lesser Antilles: Antigua, Saba (?), St. Eustatius, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On moist rocks, logs, and tree trunks in damp, shady situations at low to middle elevations.

This species resembles the "Bird's-nest fern," *Asplenium nidus*, of the Old World tropics, but does not grow to as large a size.

2. **Asplenium trichomanes-dentatum** L., Sp. Pl. **2**: 1080. 1753.

Lectotype: Plumier, Descr. Pl. Amer. *t. 50* (= Tr. Foug. *t. 101*, *fig. C*), based on material from the island of La Tortue (Tortuga), north of Port de Paix, Haiti.

Syn.: *Asplenium barbadense* Jenman in Gard. Chron. III, **15**: 134. 1894. (Type from Barbados.)

Rhizome erect, 2–5 mm. thick, minutely scaly at the apex, the blackish scales narrowly deltate-acuminate. Fronds ascending, mostly 7–15 cm. long; stipes short (1–3 cm.). Blades 1-pinnate, linear or linear-oblong, blunt or somewhat acute at the apex, slightly reduced at base, mostly 1–2.5 cm. broad, with 8–13 pairs of pinnae; rhachis grooved; pinnae oblique, delicately stalked, narrowly oblong to trapeziform-ovate, mostly 2–6 mm. broad, obtuse at the apex, the terminal 2 or 3 pinnae subconfluent, the margins crenate-dentate above the cuneate base; tissue membrano-herbaceous, the veins pinnately branched. Sori mostly 2–6 per pinna, very oblique, usually less than 4 mm. long; indusium firm, with minutely erose margin.

General Distribution: Bermuda, Florida, Greater Antilles, the Yucatan area of Central America.

Distribution in Lesser Antilles: Guadeloupe, Marie Galante, Barbados.

Habitat: Shaded boulders and ledges, chiefly of limestone, at rather low elevations.

This description is based on Lesser Antillean material, which differs from most of the Greater Antillean typical population in showing no sign of dimorphism and in a few other minor details. These differences formed the basis of Jenman's *Asplenium barbadense*; with further study, this could probably be recognized as a geographic variety.

3. **Asplenium formosum** Willd. in L., Sp. Pl. **5**: 329. 1810.

Type: *Bredemeyer, Herb. Willd. 19908,* from Caracas, Venezuela (B).
Syn.: *Asplenium nanum* Willd. in L., Sp. Pl. **5**: 323. 1810. (Based on Plumier, Tr. Foug. *t. 66, fig. B,* a very bad drawing from a plant found in Martinique.)

Rhizome short, erect or ascending, bearing at the apex a tuft of small lance-attenuate scales, these bicolorous with blackish centers and pale brown margins. Fronds numerous, tufted, mostly 8–30 cm. long; stipes very short, lustrous blackish-purple. Blades 1-pinnate, linear or narrowly linear-oblanceolate, 1.5–3 cm. broad (rarely more), acute to acuminate at the apex, gradually narrowed at base; rhachis black, narrowly yellowish-winged on the upper (adaxial) side; pinnae 20–50 pairs, nearly at right angles to the rhachis, subsessile, mostly linear-oblong from an obliquely rectangular or unequally cuneate base, 3–6 mm. broad, serrately incised except at the base, the teeth mostly bifid; tissue herbaceous, dark green, the veins simple, or forked, very oblique. Sori usually 1–3 per pinna (rarely more), confined to the unbranched basiscopic veins; indusium whitish, firm, entire, glabrous.

General Distribution: Pantropical.

Distribution in Lesser Antilles: Saba, Montserrat, Guadeloupe, Dominica, Martinique.

Habitat: Boulders and mossy ledges along streams at lower to middle elevations.

4. **Asplenium pumilum** Sw., Prodr. 129. 1788.

Type: *Swartz,* from Jamaica.
Syn.: *Asplenium anthriscifolium* Jacq., Coll. Bot. **2**: 103, *t. 2, figs. 3, 4.* 1788 (1789).
Asplenium pumilum var. *anthriscifolium* (Jacq.) Wherry, South. Fern Guide 346. 1964.

Rhizome erect, very small (2–5 mm. thick), with an apical tuft of narrowly linear, iridescent, hair-pointed scales. Fronds seasonal and deciduous, mostly 5–20 cm. long; stipes slender, often longer than the blades, sparsely clothed throughout with scattered, minute, whitish, septate hairs. Blades variable, the smaller ones 3-lobed or 3-parted, the larger ones (the basis of "var. *anthriscifolium*") broadly pentagonal (up to 9 cm. broad), with 2–4 pairs of lateral pinnae and a deltate-acuminate, lobed apical one; lowest pinnae unequally deltate, coarsely lobed (the first lobe sometimes free), the other lateral pinnae more or less lanceolate with crenate-dentate margins; tissue delicately herbaceous, with veins very oblique, subpinnately forked. Sori numerous, varying in length, up to 10 mm. long; indusium whitish-translucent with minutely ciliate margin.

GENERAL DISTRIBUTION: Florida, Greater Antilles, Virgin Islands, Tobago, continental tropical America from Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Shaded earthy or rocky banks at lower to middle elevations.

5. **Asplenium serra** Langsd. & Fischer, Icon. Fil. 16, *t. 19.* 1810.

Type: *Krusenstern*, from Santa Catarina, Brazil.
Syn.: *Asplenium serra* var. *β imrayanum* Hook., Sp. Fil. 3: 155. 1860. (Type from Dominica.)
Asplenium imrayanum (Hook.) Domin, Pter. Dominica 173. 1929.

Rhizome woody, 8–14 mm. thick, densely clothed (together with the stipe bases) with iridescent, gray-brown, lance-attenuate scales up to 15 mm. long. Fronds up to 1.5 m. long; stipes relatively short and stout, subquadrangular, brown to purple-brown. Blades 1-pinnate, oblong-acuminate, 15–40 cm. broad; rhachis like the stipe; pinnae numerous, usually short-stalked, linear-caudate to lance-attenuate, 1–3 cm. broad, unequally cuneate at base, the margins variously serrate or incised, the veins oblique, 2- to 4-forked. Sori 5–20 mm. long, inframedial (often forming a row close to the costa on either side); indusium firm, translucent, entire.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, continental tropical America from Mexico to Brazil, tropical Africa.

DISTRIBUTION IN LESSER ANTILLES: Montserrat, Guadeloupe, Dominica, St. Vincent.

HABITAT: Mossy tree trunks and rich terrestrial humus in montane rain forests at middle to higher elevations.

6. **Asplenium laetum** Sw., Syn. Fil. 79, 271. 1806; Schkuhr, Krypt. Gew. 1: 65, *t. 70.* 1809. (The latter was wrongly cited by Willd. for *A. abscissum.*)

Type: *Swartz*, from the West Indies without definite locality.
Syn.: *Asplenium inaequalidens* Fée, Mém. Fam. Foug. **11:** 34, *t. 9*, *fig. 3*. 1866. (Type from Guadeloupe.)
Asplenium resectum sensu Duss, Foug. & Lyc. Antill. Franc. 78. 1903, not Smith, 1791.

Rhizome 2–5 mm. thick, the apex bearing a tuft of small, brown, hair-like scales. Fronds few, ascending, 20–50 cm. long; stipes shorter than the blades. Blades 1-pinnate, linear-oblong, 4–8 cm. broad, acuminate (often with a serrate-caudate tip), the base truncate; pinnae 18–28 on a side (rarely less), narrowly trapeziform-oblong, 6–13 mm. broad at the middle, strongly inequilateral at base, the basiscopic edge concave and entire in the lower half, the margins elsewhere single or doubly crenate-serrate; tissue membranous, deciduously whitish-glandular beneath, the costa and veins oblique. Sori numerous; indusium pale, subentire.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Argentina.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: Wet rocks and rocky banks in deep shade at low to medium elevations.

7. **Asplenium obtusifolium** L., Sp. Pl. **2:** 1080. 1753.

Type: Petiver, Pter. Amer. *t. 2*, *fig. 14* (not "*fig. 4*" as cited by Linnaeus), copied from Plumier, Tr. Foug. *t. 67*, which was based on a plant from Morne de la Calebasse, Martinique. There is no specimen of this species in the Linnaean Herbarium.

Rhizome 2–5 mm. thick, nearly naked, the exposed apex bearing a few minute, brown, deltate-acuminate scales. Fronds subsucculent in life, deep translucent green, becoming membranous when dried, 5–40 cm. long, glabrous throughout; stipes shorter than the blades. Blades 1-pinnate, oblong to deltate-oblong, 3.5–8 cm. broad, acuminate at apex, truncate at base; rhachis obscurely green-marginate; pinnae 3–15 on a side, obliquely oblong to oblong-lanceolate, those of small fronds rounded-obtuse and entire, those of larger fronds often acuminate, at base auriculate or deeply lobed on the acroscopic side, up to 2.5 cm. broad, with margins erose-dentate to deeply and sharply serrate (except for the concave lower basiscopic side), and veins oblique, mostly 1- to 3-forked. Sori linear, slightly curved, up to 10 mm. long; indusium narrow, firm, grayish-brown, entire, glabrous.

General Distribution: Cuba (?), Puerto Rico, Tobago, Trinidad, and continental tropical America.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Wet rocks in deep shade, often in the spray of waterfalls, at chiefly middle elevations.

8. **Asplenium alatum** Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 319. 1810.

Type: *Humboldt & Bonpland, Herb. Willd. 19889*, from near Caripe, Venezuela (B).

Rhizome erect, supported by numerous wiry roots, and bearing at the apex a tuft of stiff, brown, iridescent, lance-acuminate scales up to 2.5 mm. long. Fronds clustered, arching, up to 60 cm. long; stipes brown, green-winged above, 5–20 cm. long. Blades glabrous, lance-linear, to 12 cm. broad (usually less), slightly narrowed toward base and gradually reduced above to the often naked, subflagelliform apex, this sometimes rooting at the tip; rhachis brown, the conspicuous green wings interrupted at the insertions of pinnae; pinnae mostly 14–22 to a side, 1–2 cm. broad, oblong-deltate from a broadly cuneate base, delicately short-stalked, the apex blunt to acute, the margins shallowly bicrenate or obscurely biserrate; tissue translucent-membranous, the veins oblique, mostly forked, with slightly enlarged tips not reaching the margins. Sori medial, 6–14 pairs, the longest to 7 mm. long; indusium thin, brownish, entire, glabrous.

GENERAL DISTRIBUTION: Jamaica, Hispaniola, continental tropical America from Mexico to northern South America and Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Vincent (reported by Grisebach, Fée, and Jenman). I have not seen a Lesser Antillean specimen.

HABITAT: Moist, deeply shaded ravines and glades at high elevations; plants very rare. The occurrence of this species in the Lesser Antilles needs confirmation.

9. **Asplenium malcolm-smithii** Proctor in Brit. Fern Gaz. 9(3): 75. 1962.

Type: *Proctor 19234*, from interior slopes of The Crater, St. Kitts (BM; isotypes A, IJ).

Rhizome erect or oblique, 5–6 mm. thick, clothed at the apex with dusky brown, clathrate, narrowly deltate scales up to 4 mm. long. Fronds clustered, erect; stipes 8.5–14 cm. long, minutely glandular-puberulous toward the base, broadly grooved in upper part and narrowly green-marginate. Blades lanceolate, narrowly lanceolate, or narrowly elliptic-oblong, 25–28 cm. long, 6–11.5 cm. broad, slightly reduced toward the base, acuminate at apex; rhachis narrowly green-winged above; pinnae 16–20 pairs, trapeziform-oblong, spreading or the lower ones deflexed, of irregular length on each frond, 3–6 cm. long, 1–1.6 cm. broad near the inequilateral sessile base, acuminate to caudate at apex, the margins obliquely crenate-dentate with teeth 1.2–1.7 mm. broad at base, and veins oblique, the lowest acroscopic one 2-forked, the middle ones on both sides 1-forked, those toward the apex simple. Sori 6–11 pairs, inframedial, 2.5–

5.5 mm. long; indusium hyaline, entire, concealing the sporangia. Spores apparently all abortive.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts.

Habitat: Steep rocky slopes in deep shade, inside a wooded volcanic crater.

This species probably represents a hybrid between *Asplenium abscissum* and *A. pteropus.*

10. **Asplenium pteropus** Kaulf., Enum. Fil. 170. 1824.

Type: *Chamisso*, from Brazil.

Syn.: *Asplenium lunulatum* sensu Griseb., Fl. Br. W. Ind. 681. 1864, in part, with regard to ref. St. Vincent, not Sw., 1806.

Asplenium regulare sensu Fée, Mém. Fam. Foug. **11:** 34. 1866, not Sw., 1817.

Asplenium lunulatum var. *pteropus* (Kaulf.) Sodiro in Anal. Univ. Quito **8:** 276. 1893.

Asplenium pseuderectum Hieron. in Hedwigia **60:** 239. 1918. (Lectotype from Puerto Rico.)

Rhizome suberect, 5–10 mm. thick, the apex bearing a tuft of stiff, blackish-brown, lance-attenuate scales, these up to 7 mm. long. Fronds spreading or laxly ascending, glabrous, 25–60 cm. long; stipes narrowly green-winged, relatively very short (1–10 cm.). Blades linear, 4–8 cm. broad near the middle, long-acuminate at apex, slightly narrowed toward the base; rhachis narrowly green-winged, the wings 0.5–0.8 mm. broad; pinnae spreading or deflexed, trapeziform-oblong or narrowly deltate from a strongly inequilateral, subauriculate base, acuminate to somewhat acute at the apex, the margins obliquely crenate-dentate, with teeth 1.5–2.5 mm. broad at base, broader than long, the veins oblique, mostly simple. Sori 5–12 pairs, 2–4 mm. long, inframedial; indusium thin, pale, entire, glabrous.

General Distribution: Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: Chiefly on mossy logs and tree trunks in rain forests at middle elevations.

11. **Asplenium harpeodes** Kunze in Linnaea **18:** 329. 1844.

Lectotype: *Leibold 26*, collected in Mexico (B) (as selected by Morton & Lellinger in Mem. N. Y. Bot. Gard. **15:** 15. 1966).

Rhizome erect or ascending, 7–11 mm. thick, the apex bearing a dense tuft of reddish-brown, linear-attenuate scales, these up to 10 mm. long.

Fronds glabrous, laxly spreading or sometimes pendent, mostly 25–75 cm. long (rarely more); stipes dark, glossy, very short (3–15 cm.). Blades 1-pinnate, linear, 3.5–15 cm. broad, often irregular, acuminate at the apex, truncate or slightly narrowed at base; rhachis narrowly greenish-winged; pinnae spreading or deflexed, narrowly deltate-attenuate from a strongly inequilateral base, acuminate and often falcate to long-caudate at the apex, the margins obliquely crenate-dentate (except for lower basiscopic side), with teeth mostly 1–1.5 mm. broad at base, the veins oblique, mostly simple. Sori inframedial, 6–16 pairs, 1–6 mm. long, closely parallel; indusium narrow, pale, translucent, entire.

General Distribution: Jamaica, Hispaniola, continental tropical America from Mexico to Bolivia and Brazil.

Distribution in Lesser Antilles: Guadeloupe (reported by Duss), Dominica (reported by Jenman), Martinique (reported by Duss), St. Vincent (?) (reported by Fée). No Lesser Antilles specimens were seen during the preparation of the present work and some or all the cited records may have been based on misidentifications. The acceptance of this species for the Lesser Antilles requires further confirmation.

Habitat: Epiphytic or in mossy humus at high elevations.

12. **Asplenium abscissum** Willd. in L., Sp. Pl. 5: 321. 1810, excl. ref. Schkuhr.

Lectotype: *Bredemeyer, Herb. Willd. 19893, sheet 1* (excl. fragm.), from Caracas, Venezuela (B).

Rhizome erect or ascending, ca. 5 mm. thick, the apex bearing a small tuft of dark brown, narrowly deltate, acuminate scales ca. 1.5 mm. long. Fronds few, ascending, 15–40 cm. long; stipes narrowly greenish-marginate, about as long as the blades. Blades narrowly to broadly deltate-oblong or ovate-oblong, 5–16 cm. broad, acuminate to subcaudate at apex, truncate at base; rhachis like the stipe; pinnae few (5–9 on a side), trapeziform-oblong to narrowly oblong-lanceolate, 8–18 mm. broad, attenuate to somewhat acute at the apex, inequilateral at base (not or only slightly auriculate), the margins doubly or triply dentate-serrate; tissue thinly herbaceous, glabrate, the veins subarcuate, oblique, mostly 1- to 3-forked. Sori distant, inframedial, to 9 mm. long; indusium brownish, entire.

General Distribution: Florida, Greater Antilles, Trinidad, continental tropical America from Mexico to Brazil.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent (reported by Domin), Grenada.

Habitat: Shaded rocky slopes and moist ravines at low to medium elevations.

13. Asplenium salicifolium L., Sp. Pl. 2: 1080. 1753.

Lectotype: Plumier, Descr. Pl. Amer. *t. 27* (= Tr. Foug. *t. 60*), based on material from the French West Indies without definite locality.
Syn.: *? Asplenium gibbosum* Fée, Mém. Fam. Foug. **5**: 195. 1852. (Type from Guadeloupe.)

Rhizome erect or curved-ascending, the apex bearing deltate-lanceolate, attenuate scales up to 6 mm. long. Fronds few, ascending, glabrous, 15–70 cm. long; stipes grooved, naked, shorter than to nearly as long as the blades. Blades narrowly to broadly oblong, abruptly caudate-acuminate at the apex, truncate at base; pinnae simple, mostly 9–16 on a side, alternate, short-stalked, strongly inequilateral at base (excavate or narrowly cuneate in a straight line on basiscopic side, more or less auriculate on the acroscopic side, the auricles often overlapping the rhachis), 0.7–2 cm. broad above the base; veins oblique, 1- to 2-forked, with tips not reaching the margins. Sori very oblique, linear; indusium firm, light brown, opaque, entire, glabrous.

This species is represented in the West Indies by two varieties not always easy to distinguish. In a recent publication (Morton & Lellinger, 1966) they have been treated as separate species, but I do not believe that this separation can be justified. Morton and Lellinger key out these plants as follows:

a. Veins simple or only one-forked; blades not more than 9 cm. broad; pinnae numerous, obtuse to acuminate, not falcate, simply and deeply crenate, the teeth 10–17 on the upper margin .... *A. auriculatum*
a. Veins mostly twice-forked; blades up to 20 cm. broad; pinnae long-acuminate, falcate, doubly crenate, the teeth low, 17–30 on the upper margin .... *A. salicifolium*

Although my own measurements do not exactly tally with those given above, this key will separate most of the specimens from the Lesser Antilles into two groups. However, some material does not fit easily with either group, but appears to combine characters of both. In my opinion, therefore, these plants are better treated as varieties of a single species.

13a. Asplenium salicifolium var. salicifolium

General Distribution: Greater Antilles, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On mossy tree trunks and boulders in moist rain forests at lower to middle elevations.

13b. Asplenium salicifolium var. auriculatum (Sw.) Proctor, comb. & stat. nov.

Basionym: *Asplenium auriculatum* Sw. in Kongl. Sv. Vet. Akad. Handl. **1817**: 68. 1817.

Type: *Freyreis*, from Rio de San Francisco, Minas Gerais, Brazil (BM, isotype).
Syn.: *Asplenium semicordatum* Raddi, Pl. Bras. **1**: 36, *t. 52, fig. 1.* 1825. (Type from Brazil.)

General Distribution: Greater Antilles, Costa Rica, Panama, northern South America, Brazil.

Distribution in Lesser Antilles: Guadeloupe, *Mazé* (IJ), *Proctor 20162* (A, IJ).

Habitat: Mossy tree trunks in rain forest at middle elevations.

14. **Asplenium auritum** Sw. in J. Bot. Schrader 1800(2): 52. 1801.

Type: *Swartz*, from Jamaica.

Plants more or less fragrant, especially when dry. Rhizome erect or semidecumbent, clothed with the fibrous remains of old stipe bases, at the apex bearing a tuft of scales, these brown, slightly iridescent, deltate-ovate, to 3 mm. long and 2 mm. broad. Fronds clustered, glabrous, mostly 15–45 cm. long; stipes grooved, bicolorous, shorter than the blades. Blades variable in dissection, narrowly to broadly oblong, 3–12 cm. broad, long-acuminate at apex, truncate at base; rhachis narrowly winged; pinnae rather numerous, all inequilateral at base, usually more or less auriculate at base on acroscopic side, the lower ones short-stalked; tissue firm, opaque, the veins oblique, usually forked. Sori elliptic; indusium firm, pale brown, entire and glabrous.

This is an extremely variable species, the different forms widely distributed in tropical America. The typical variety does not occur in the Lesser Antilles; the two varieties recorded from this area can be distinguished as follows:

a. Pinnae nearly entire, blunt or rounded at the apex; rhachis often rather broadly winged .... a. var. *obtusum*
a. Pinnae deeply pinnatifid to fully pinnate (usually with one or more free pinnules at base), long-acuminate at the apex; rhachis marginate but not winged .... b. var. *rigidum*

14a. **Asplenium auritum var. obtusum** Kunze ex Mettenius, Fil. Hort. Lips. 127, *t. 8, figs. 3–6.* 1856.

Lectotype: A cultivated specimen "*ex Hort. Lips.*", of unstated origin (B) (as selected by Morton & Lellinger in Mem. N. Y. Bot. Gard. **15**: 18. 1966).
Syn.: *Asplenium macilentum* Kunze ex Klotzsch in Linnaea **20**: 351. 1847.
Asplenium auritum var. *macilentum* (Kunze ex Klotzsch) T. Moore, Ind. Fil. 115. 1859.

General Distribution: Jamaica, Hispaniola, continental tropical America.

DISTRIBUTION IN LESSER ANTILLES: Martinique, *Hahn 57* (P), *Proctor 21804* (A, IJ).

HABITAT: On mossy tree trunks at middle elevations; plants rare.

The fronds of this variety tend to be smaller and noticeably more rigid than those of the following, which makes the latter's name rather inappropriate.

14b. **Asplenium auritum var. rigidum** (Sw.) Hook., Sp. Fil. 3: 180. 1860.

Basionym: *Asplenium rigidum* Sw. in Kongl. Sv. Vet. Akad. Handl. 1817: 68. 1817.
Type: *Freyreis*, from Villa Rica, Minas Gerais, Brazil (S).
Syn.: *Asplenium auritum* var. *sulcatum* sensu Duss, Foug. & Lyc. Antill. Franc. 84. 1903, not *Asplenium sulcatum* Lam., 1786.

GENERAL DISTRIBUTION: Northern South America, Brazil.

DISTRIBUTION IN LESSER ANTILLES: Saba, St. Eustatius, St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia.

HABITAT: On mossy tree trunks, occasionally on boulders, at middle elevations; plants common.

15. **Asplenium radicans** L., Syst. Nat. ed. 10, 2: 1323. 1759, excl. ref. Sloane & Plukenet. var. **cirrhatum** (Rich. ex Willd.) Rosenst. in Hedwigia 46: 102. 1906.

Basionym: *Asplenium cirrhatum* Rich. ex Willd. in L., Sp. Pl. 5: 321. 1810.
Type: *L. C. Richard*, from Guadeloupe (B – *Herb. Willd. 19894*; isotype P).
Syn.: *Asplenium mastigophyllum* Fée, Mém. Fam. Foug. 8: 83. 1857. (Type from Guadeloupe.)
Asplenium rhizophorum [var.] α *cirrhatum* (Rich. ex Willd.) Griseb., Fl. Br. W. Ind. 684. 1864.
Asplenium rhizophorum sensu Duss, Foug. & Lyc. Antill. Franc. 82. 1903, not L., 1764.
Chamaefilix cirrhatum (Rich. ex Willd.) Farwell in Amer. Midl. Nat. 12: 270. 1931.

Rhizome ascending or erect, clothed at apex with lance-attenuate, blackish-clathrate scales. Fronds few, ascending-recurved, 25–50 cm. long; stipes much shorter than the blades. Blades narrowly lance-oblong, essentially 1-pinnate, long-attenuate to the flagelliform, naked apex; pinnae numerous, spreading, oblong to oblong-lanceolate, mostly 2–4.5 cm. long, 0.7–1.3 cm. broad, obtuse to acuminate at apex, unequally cuneate at base, often more or less auriculate at base on acroscopic side (or rarely the lowest pinnae each with a single free pinnule), the veins very oblique, simple or 1-forked, with enlarged tips not reaching the crenate-serrate margins. Sori medial, mostly 2–6 mm. long; indusium pale brown, entire, glabrous.

General Distribution: Greater Antilles except Cuba; widespread in continental tropical America.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Terrestrial in moist forest glades and shaded ravines at middle elevations; plants rare. Very occasionally this species occurs on mossy tree trunks.

Several varieties with more finely divided blades occur widely in the American tropics.

16. **Asplenium cristatum** Lam., Encycl. Méth. Bot. 2: 310. 1786.

Type: Collector not stated, *Herb. Jussieu, Cat. 1276*, from the "Antilles" without definite locality (P).

Syn.: *Asplenium cicutarium* Sw., Prodr. 130. 1788. (Type from Jamaica.)

Rhizome erect, 5–10 mm. thick, at apex bearing a tuft of blackish-brown, rigid, lance-attenuate scales. Fronds closely clustered, suberect, glabrous, 20–75 cm. long; stipes narrowly green-marginate, relatively short or often nearly as long as the blades. Blades 3-pinnate, lanceolate to deltate-oblong, 4–16 cm. broad, long-acuminate at the apex, abruptly reduced or truncate at base; pinnae 1–2.5 cm. broad, long-acuminate to somewhat acute, the base usually partly overlying the rhachis; pinnules numerous, close, spreading, obliquely deltate-oblong or ovate-oblong, obtuse, coarsely pinnatisect; ultimate divisions simple or bifid; tissue thin-herbaceous, dull dark green, the veins solitary within the ultimate divisions. Sori short, elliptic or oval; indusium thinly membranous, entire, glabrous.

General Distribution: Florida, Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Bolivia and Brazil.

Distribution in Lesser Antilles: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Rich forested slopes and shaded rocky stream banks at lower to middle elevations.

17. **Asplenium cuneatum** Lam., Encycl. Méth. Bot. 2: 309. 1786.

Type: Collector not stated, *Herb. Jussieu, Cat. 1255*, from an unknown locality (P). Lamarck also cited Sloane, Hist., Vol. 1, *t. 46, fig. 2*, representing a specimen from Jamaica. Sloane's plant (BM) agrees with Lamarck's type.

Syn.: *Asplenium martinicense* Willd. in L., Sp. Pl. 5: 344. 1810. (Type from Martinique.)

Rhizome usually erect, ca. 8 mm. thick, bearing blackish-brown, somewhat iridescent, stiff, deltate-lanceolate scales. Fronds arching or spreading, glabrous, 25–60 cm. long; stipes glossy brown, about half as long as the blades. Blades 2- to 3-pinnate, oblong-lanceolate to narrowly deltate-ovate, 6–24 cm. broad, long-acuminate at the apex, truncate at base; pinnae spreading, elongate-deltate, 2–5 cm. broad at base, acuminate to serrate-attenuate at apex; pinnules oblique, anadromous, ovate-oblong or obovate-cuneate, obliquely and deeply crenate-dentate or else 1- to 3-lobed with dentate margins the larger ones stalked; tissue herbaceous, dark green, the veins flabellate-pinnate. Sori few, very oblique, narrowly linear, 2–6 mm. long; indusium brown, firm, entire, becoming revolute.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Guatemala to Peru and Brazil. Closely related forms also occur in the Old World tropics.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Tree trunks and mossy stumps in rain forests at middle elevations.

Doubtful Records

Asplenium cuspidatum Lam., Encycl. Méth. Bot. 2: 310. 1786, was attributed to Guadeloupe and Martinique by Duss, 1903, under the later name *Asplenium fragrans* Sw. (1788). No material corresponding to this species has been seen from the Lesser Antilles during the preparation of the present work. Duss's records probably pertain to *Asplenium auritum* var. *rigidum*.

Asplenium marinum L., Sp. Pl. 2: 1081. 1753, was reported from St. Vincent by Jenman (Ferns Br. W. Ind. & Guiana 161, 162. 1907) on the basis of a specimen he had seen at Kew, allegedly collected by Guilding. I have examined this material, which consists of only a single frond; the determination seems correct, but the record seems unlikely and may perhaps represent an error of labelling by Hooker, who originally received Guilding's collections from St. Vincent. *A. marinum* is a plant of sea cliffs with a wide western European range from the Orkney Islands to the Azores. Its occurrence in suitable habitats along the western side of the Atlantic has several times been reported but never really confirmed.

Subfamily POLYPODIOIDEAE

Key to the Genera

a. Sori round or oval .... 43. *Polypodium*
a. Sori more or less elongate.
  b. Fronds naked, devoid of scales .... 44. *Neurodium*
  b. Fronds bearing minute scales on the tissue.
    c. Blades simple .... 43. *Polypodium* (*P. astrolepis*)
    c. Blades pinnatisect .... 45. *Dicranoglossum*

POLYPODIUM Linnaeus

Polypodium L., Sp. Pl. 2: 1082. 1753. FIGURE 57.

Syn.: *Goniophlebium* C. Presl, Tent. Pter. 185. 1836.

Small to large chiefly epiphytic ferns of varied habit, a few species also growing on rocks. Rhizomes creeping, often slender, bearing scales (these often clathrate) or sometimes nearly naked. Fronds articulate to the rhizome, all similar or somewhat dimorphic, mostly stipitate, glabrous or sometimes hairy, with or without scales. Blades simple to pinnatisect (or to 3-pinnate in species outside the Lesser Antilles), with the margins usually entire, and veins branched, free or variously reticulate, the areoles with or without included free veinlets. Sori round or oval (rarely linear), mostly terminal on free veinlets, not marginal, usually in 1 or more regular rows; indusium lacking; paraphyses present or absent. Sporangia with annulus of 12–18 cells; spores bilateral, with smooth to tuberculate perispore.

TYPE SPECIES: *Polypodium vulgare* L., of northern Europe.

A cosmopolitan group of about 225 species, of which 22 are here recorded from the Lesser Antilles. Strong differences of opinion exist as to the generic subdivision of this polymorphic group. In conformity with views expressed earlier in the present volume, and in consistency with the treatment of such taxa as *Trichomanes*, *Cyathea*, and *Thelypteris*, I prefer to exercise the concept of subgenera within a broad definition of the genus *Polypodium*.

SPECIAL LITERATURE: Weatherby, The group of *Polypodium polypodioides*, in Contr. Gray Herb. **124**: 22–35. 1939; Sota, Polypodiaceae y Grammitidaceae Argentinas, in Opera Lilloana **5**: 1–229. 1960; Lellinger, A revision of the fern genus *Niphidium*, in Amer. Fern J. **62**: 101–120. 1972.

KEY TO THE SUBGENERA

a. Blades pinnatisect to pinnate.
  b. Veins all free, or if reticulate the areoles in uniform rows, each with a single included free veinlet .... Subg. *Polypodium*
  b. Veins reticulate, the areoles not uniform, some without included veinlets, and at least some others with paired included veinlets, these usually united at their tips; rhachis winged throughout . . Subg. *Phlebodium*
a. Blades simple, nearly always entire.
  c. Vein areoles in uniform rows, each areole with a single included free excurrent veinlet; blades glaucous beneath .... Subg. *Polypodium* (*P. glaucophyllum*)
  c. Vein areoles not uniform; blades not glaucous.
    d. Sori uniseriate on either side of the main costa; rhizome slender, elongate, the fronds distant.
      e. Sori round, bearing filamentous paraphyses, these simple or branched; fronds often dimorphic .... Subg. *Microgramma*

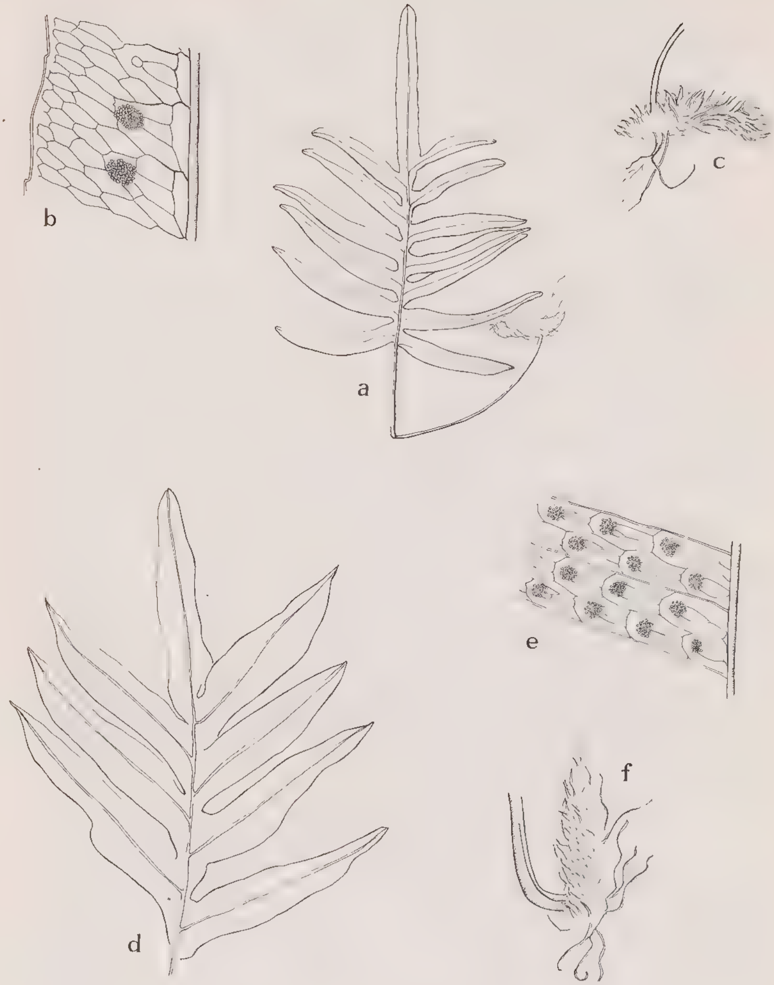

FIGURE 57. **Polypodium.** a–c, *P. aureum* var. *areolatum*: a, habit, × 0.15; b, section of blade with sporangia, the venation flexuous, irregular, and not prominent, × 2.5; c, rhizome, × 0.1. d–f, *P. decumanum*: a, apex of blade, × 0.15; e, section of blade with sporangia, the venation prominent, straight, and parallel, × 1.3; f, rhizome, × 0.1.

- e. Sori oval to somewhat elongate, bearing scalelike peltate paraphyses (these soon deciduous); fronds not dimorphic . . . . Subg. *Pleopeltis*
- d. Sori pluriseriate on either side of the main costa; rhizome short, with clustered fronds (except *Polypodium repens*, subg. *Campyloneurum*).
  - f. Sori in 2 rows between principal side veins; sporangia glabrous . . . . Subg. *Campyloneurum*
  - f. Sori in 1 row between principal side veins; sporangia pubescent . . . . Subg. *Niphidium*

Subgenus POLYPODIUM

KEY TO THE SPECIES

- a. Blades pinnatisect.
  - b. Veins all free (or a few joined near the margins in *Polypodium pectinatum* and *P. polypodioides*)
    - c. Fronds without scales (unless a few on rhachis beneath).
      - d. Segments 2–7 mm. broad, all somewhat dilated at the base; sori round.
        - e. Rhachis with scattered minute scales beneath; segments not over 2 mm. broad above the dilated base . . . . . . 1. *P. plumula*
        - e. Rhachis with minute hairs but no scales; segments to 7 mm. broad above the dilated base . . . . 2. *P. pectinatum*
      - d. Segments 8–22 mm. broad, at least the lower ones constricted at the base; sori oval or elliptic . . . . 3. *P. dissimile*
    - c. Fronds densely scaly throughout beneath . . . . . . 4. *P. polypodioides*
  - b. Veins at least partly reticulate.
    - f. Fronds densely scaly throughout beneath . . . . 4. *P. polypodioides*
    - f. Fronds without scales.
      - g. Rhizome elongate, cordlike, 2–5 mm. thick, bearing a few scattered appressed scales, otherwise naked; blades glabrous . . 5. *P. loriceum*
      - g. Rhizome short-creeping, cylindric, 8–14 mm. thick, densely scaly.
        - h. Blades pubescent throughout on both sides . . . 6. *P. chnoodes*
        - h. Blades glabrous or nearly so.
          - i. Pinnae mostly less than 1.2 cm. broad; sori strictly 1-seriate on either side of the costa; rhizome scales 1–1.5 cm. long, delicately clathrate, attached at or near base . . . . 7. *P. antillense*
          - i. Pinnae mostly 1.5–3 cm. broad; sori 1- to 3-seriate; rhizome scales not over 0.5 cm. long, densely clathrate, peltately attached . . . . 8. *P. triseriale*
- a. Blades simple, entire; rhizome nearly naked, elongate, its few scattered scales round, dark brown, and peltate; blades whitish-glaucous beneath . . . . 9. *P. glaucophyllum*

1. **Polypodium plumula** Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 178. 1810.

Lectotype: *Bredemeyer, Herb. Willd. 19655, sheet 1*, from Caracas, Venezuela (B).

Rhizome short-creeping, 4–10 mm. thick, densely scaly, the scales linear-deltate, attenuate, dark brown, 2–4 mm. long, with denticulate margins; stipes 3–8 cm. long, blackish, puberulous. Blades elastic-hygroscopic, oblong or linear-oblong, 12–25 cm. long, mostly 3–5 cm. broad; rhachis dark brown or blackish, minutely pubescent (some of the hairs beneath being glandular), bearing a few small brown scales beneath; segments numerous, close, horizontal, ligulate, with ciliolate margins; tissue and costae minutely septate-puberulous, the costae blackish, the veins obscure. Sori terminal on forks of distal veins.

General Distribution: Florida, Greater Antilles, continental tropical America.

Distribution in Lesser Antilles: Saba, Guadeloupe, Martinique.

Habitat: Mossy boulders, rotten logs, and on tree trunks in forested areas at chiefly middle elevations; plants rare in the Lesser Antilles.

2. **Polypodium pectinatum** L., Sp. Pl. 2: 1085. 1753.

Lectotype: Petiver, Pter. Amer. *t. 7*, *fig. 14*, copied from Plumier, Descr. Pl. Amer. *t. 37* (= Tr. Foug. *t. 83*), based on material from Martinique. Linnaeus wrongly attributed this to Jamaica, misled by Petiver, who engraved the words "JAM" (= Jamaica) and "In Hedges and Paths" with his figure.

Rhizome short-creeping, 4–10 mm. thick, densely scaly, the scales dark brown, flexuous-acicular from a narrowly deltate base, 4–6 mm. long, the margins distantly septate-ciliate; stipes mostly 3–12 cm. long (rarely more), dark purple-brown, scaly at base. Blades linear to lance-elliptic or oblanceolate, 20–90 cm. long, 5–13 cm. broad at the middle, somewhat tapering at both ends; rhachis whitish-puberulous; segments ligulate; tissue often finely hirtellous, especially beneath, the ultimate veinlets sometimes casually joined near the margins. Sori terminal on first branches of distal veins.

General Distribution: Florida, Greater Antilles, continental tropical America.

Distribution in Lesser Antilles: St. Eustatius, St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Mossy banks, logs, and tree trunks, at chiefly middle elevations.

3. **Polypodium dissimile** L., Syst. Nat. ed. 10, 2: 1325. 1759, excl. ref. Plukenet.

Type: *P. Browne*, LINN *1251.24*, from Jamaica.
Syn.: *Polypodium sororium* Humb. & Bonpl. ex Willd. in L., Sp. Pl. 5: 191. 1810. (Type from Venezuela.)

Rhizome creeping, 5–8 mm. thick, densely scaly, the scales ovate-attenuate, light reddish-brown, 4–8 mm. long, subentire, sometimes ciliate;

stipes 15–25 cm. long, minutely and sparsely puberulous. Blades linear-oblong to deltate-oblong, 25–65 cm. long, 7–25 cm. broad, fully pinnate at base, pinnatisect above to the acuminate, pinnatifid, ultimately caudate apex; rhachis densely septate-hirtellous above, glabrate beneath; pinnae narrowly oblong to ligulate, 8–22 mm. broad, often constricted at one or both sides at the base; the margins distantly ciliolate; tissue glabrate, the veins 2- to 4-times pinnately forked. Sori terminal on the first distal branches, oval, uniseriate, slightly inframedial.

General Distribution: Greater Antilles and continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: Mossy earth banks, rotten logs, and tree trunks in moist forests at middle to higher elevation.

4. **Polypodium polypodioides** (L.) Watt in Canadian Nat. II, 13: 158. 1867.

Basionym: *Acrostichum polypodioides* L., Sp. Pl. 2: 1068. 1753.
Lectotype: *Plukenet*, from Jamaica (BM) (selected by Weatherby in Contr. Gray Herb. 124: 28. 1939).
Syn.: *Polypodium incanum* Sw., Prodr. 131. 1788.
Polypodium velatum Schkuhr, Krypt. Gew. 1: 188, *t. 11b.* 1809.
Lepicystis incana (Sw.) J. Smith in London J. Bot. 1: 195. 1842.
Marginaria polypodioides (L.) Tidestrom in Torreya 5: 171. 1905.

Rhizome wide-creeping, 1–2 mm. thick, scaly, the scales lance-subulate, 3–4 mm. long, dark brown with pale denticulate-ciliolate margins; stipes mostly 2–8 cm. long, densely appressed-scaly. Blades more or less oblong to narrowly deltate-oblong, 4–15 cm. long, 1.5–6 cm. broad, pinnatisect, densely scaly beneath, the scales roundish to deltate-ovate, peltate, very sparsely scaly on the upper side, these scales slender, pale, and fimbriate; segments 2.5–5 mm. broad, rounded at apex, dilated at base; tissue strongly hygroscopic, the whole frond curling up tightly during dry periods, then expanding after rain, the veins obscure, free to more or less reticulate. Sori supramedial, protruding from pockets in the tissue.

General Distribution: Bahamas, Greater Antilles, continental tropical America from Mexico to Costa Rica, Venezuela. This distribution applies to var. *polypodioides*; other varieties extend the range of the species from eastern temperate United States to Argentina.

Distribution in Lesser Antilles: St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenadines (Union), Grenada, Barbados.

Habitat: On rocks and trees at lower to middle elevations; plants common.

5. **Polypodium loriceum** L., Sp. Pl. 2: 1086. 1753.

Lectotype: Petiver, Pter. Amer. *t. 7, fig. 10* (but not *fig. 12*), copied from Plumier, Tr. Foug. *t. 78*, based on material from Morne de la Calebasse, Martinique.
Syn.: *Goniophlebium loriceum* (L.) J. Smith ex Hook., Gen. Fil. *under t. 51.* 1840.

Rhizome cordlike, green or whitish, 2–5 mm. thick, bearing scattered appressed scales, these roundish, peltate, clathrate, and dark brown with pale, fimbriate margins. Fronds distantly attached; stipes 10–30 cm. long, glabrous. Blades linear-oblong to ovate-oblong, 20–60 cm. long, 7–25 cm. broad, pinnatisect (rarely pinnate), the apex acuminate-caudate; rhachis with a few scattered scales beneath; segments ligulate, falcate, 7–15 mm. broad, adnate, surcurrent, the veins forming areoles in 1 or 2 series on either side of the costa. Sori evenly 1- or 2-seriate.

General Distribution: Greater Antilles, Tobago, Trinidad, continental tropical America.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Mossy banks, logs, and tree trunks in moist forests at middle to higher elevations.

6. **Polypodium chnoodes** Sprengel, Neue Entd. 3: 6. 1822.

Type: *Kohaut, Sieber Exsicc.* (number not cited), from Martinique.
Syn.: *Marginaria chnoodes* (Sprengel) C. Presl, Tent. Pter. 189. 1836.
Goniophlebium chnoodes (Sprengel) Fée, Mém. Fam. Foug. 5: 255. 1852.

Rhizome creeping, cylindric, 8–14 mm. thick, densely scaly, the scales filiform from a deltate-ovate base, 5–10 mm. long, dark gray-brown, strongly clathrate and iridescent. Fronds few; stipes 8–20 cm. long, puberulous. Blades oblong, 20–90 cm. long, 10–25 cm. broad, pinnatisect throughout except near the apex, pubescent on both sides with whitish septate hairs; pinnae subopposite, ligulate, falcate, mostly 1–2 cm. broad, the lower ones cordate-clasping at base, the veins forming areoles in 2 to 4 series on either side of the costa. Sori small, 2- to 4-seriate.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Guatemala to Colombia.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Mossy logs and trunks of forest trees at chiefly middle elevations.

7. **Polypodium antillense** Maxon in Proc. Biol. Soc. Washington **43**: 83. 1930.

Type: *L'Herminier in 1861*, from Guadeloupe (B, isotype).
Syn.: *Goniophlebium acuminatum* Fée, Mém. Fam. Foug. **11**: 68, *t. 19, fig. 1.* 1866, not *Polypodium acuminatum* Houtt., 1786, Roxb., 1825, nor Sodiro, 1893.
Polypodium surucuchense sensu Griseb., Fl. Br. W. Ind. 698. 1864; Duss, Foug. & Lyc. Antill. Franc. 49. 1903, not Hook., 1837. (The true *P. surucuchense* of continental tropical America differs in having broad, short areoles, prominent whitish-translucent venation, and much larger sori.)

Rhizome creeping, ca. 1 cm. thick, densely clothed with iridescent brown, linear-attenuate scales. Fronds glabrous; stipes mostly 15–35 cm. long, terete, lustrous, 1.5–3 mm. thick. Blades oblong-ovate to ovate, 20–45 cm. long, 10–22 cm. broad, abruptly acuminate to a caudate apex, truncate at base, pinnate, the simple entire pinnae mostly free except toward the apex; pinnae sessile, broadly cuneate at base, narrowly acuminate and often falcate at the apex, 7–11 mm. broad, the veins immersed, not prominulous, ending in small hydathodes evident on the upper side. Sori in a single row on either side near the costa, superficial, densely paraphysate.

General Distribution: Jamaica, Hispaniola.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Epiphytic on large forest trees at middle to higher elevations; plants rare.

8. **Polypodium triseriale** Sw. in J. Bot. Schrader **1800**(2): 26. 1801.

Type: *Herb. Thunberg*, from an unknown locality.
Syn.: *Polypodium brasiliense* Poiret in Lam., Encycl. Méth. Bot. **5**: 525. 1804; Domin, Pter. Dominica 131. 1929.
Goniophlebium intermedium Fée, Mém. Fam. Foug. **11**: 69, *t. 18, fig. 3.* 1866 (type from Guadeloupe), not *Polypodium intermedium* Colla, 1836, Hook. & Arnott, 1841, nor Rupr., 1845.

Rhizome creeping, cylindric, 8–12 mm. thick, covered with appressed scales, these ovate-acuminate, dark brown and subclathrate with paler, irregular margins; stipes mostly 10–35 cm. long, glabrous. Blades ovate or oblong-ovate, 20–50 cm. long or more, 15–40 cm. broad, pinnate, the lower pinnae nearly free, the upper ones constricted near base but adnate, inequilateral; pinnae narrowly to broadly ligulate, mostly 1.5–3 cm. broad at the middle, narrowed slightly toward both ends, the apex blunt to acuminate, the margins entire, with veins prominulous on both sides. Sori in 1–3 regular rows on either side of the costa, each immersed in a shallow pit in the frond tissue.

General Distribution: Cuba (?), Jamaica, Trinidad, and sporadically in continental tropical America. Doubt about the distribution of this species is partly due to uncertainty about its relationship with *P. ampliatum* and perhaps others.

Distribution in Lesser Antilles: Saba, St. Eustatius, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, Grenada.

Habitat: On shaded rocks and trees at lower to middle elevations.

9. **Polypodium glaucophyllum** Kunze in Linnaea 20: 393. 1847.

Syntypes: *Otto 570*, from Venezuela, and *Moritz 305*, from Colombia.
Syn.: *Goniophlebium glaucophyllum* (Kunze) Fée, Mém. Fam. Foug. 5: 255. 1852.

Rhizome elongate, nearly naked, with a few scattered scales, these round, peltate, and dark brown. Fronds scattered, entirely glabrous; stipes 4–20 cm. long. Blades oblong-lanceolate to ovate-lanceolate, 10–25 cm. long, 2.5–6(–7) cm. broad, acuminate-caudate at the apex, truncate or nearly so at base, with veins forming regular areoles in many series, each areole containing a single, excurrent, free veinlet. Sori usually multiseriate, the fertile fronds often smaller than the sterile ones on the same plant.

General Distribution: South America from Venezuela and Colombia to Peru and Bolivia.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: Epiphytic on rain forest trees at middle elevations; plants not common.

Subgenus PHLEBODIUM

Key to the Species

a. Segments 5–8 mm. broad; venation obscure, the areoles uniseriate; rhizome scales entire .... 10. *P. sectifrons*
a. Segments usually over 15 mm. broad; venation evident, the areoles multiseriate; rhizome scales denticulate.
    b. Primary veins not evident, or at most flexuous, irregular and not prominent; sori in 1 or 2 rows; rhizome scales less than 1 cm. long .... 11. *P. aureum*
    b. Primary veins prominent, straight, parallel; sori usually multiseriate (to 7 rows); rhizome scales to 2 cm. long or more ...... 12. *P. decumanum*

10. **Polypodium sectifrons** Kunze ex Mettenius in Abh. Senck. Nat. Ges. Frankfurt 2: 99. 1857.

Syntypes: *Schwanecke*, from Puerto Rico, and *Breutel*, from St. Kitts.
Syn.: *Drynaria elastica* Fée, Mém. Fam. Foug. 11: 72, *t. 20, fig. 2.* 1866 (type from Guadeloupe), not *Polypodium elasticum* Bory ex Willd. in L., 1810.

Rhizome short-creeping, densely clothed with linear-attenuate, brown to bright yellowish-brown, entire, glabrous scales ca. 5 mm. long. Fronds close; stipes 8–25 cm. long, pilose at base with spreading brownish hairs, glabrous above, often decurved or geniculate at the apex. Blades spreading or subpendent, oblong to deltate-orbicular, 15–30 cm. long, 7–25 cm. broad, deeply pinnatifid; segments decurrent at base, joined along the rhachis by a broad continuous wing; tissue densely spongiose, concealing the venation, sparsely and minutely glandular. Sori few, distant, irregularly uniseriate, oval and 2–4 mm. broad, paraphysate.

GENERAL DISTRIBUTION: Greater Antilles except Cuba; Costa Rica.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe.

HABITAT: Mossy trunks of large forest trees at middle elevations; plants rare.

This species is placed in subgenus *Phlebodium* with some doubt.

11. **Polypodium aureum** L., Sp. Pl. 2: 1087. 1753.

Type: LINN *1251.10*, from "America." Linnaeus cited several collateral references, including Plumier, Descr. Pl. Amer. 25, *t.* "*25*" (should be *t. 35*) (= Tr. Foug. 59, *t. 76*), whose material was collected in Martinique.

Syn.: *Polypodium dulce* Poiret in Lam., Encycl. Méth. Bot. **5**: 523. 1804, excl. ref. Plumier. (Type from Martinique in *Herb. Juss.*)
Phlebodium aureum (L.) J. Smith in J. Bot. Hook. **4**: 59. 1841.
Chrysopteris aurea (L.) Link, Fil. Hort. Berol. 121. 1841.
Chrysopteris dulcis (Poiret) Fée, Mém. Fam. Foug. **5**: 265. 1852.
Chrysopteris martinicensis Fée, Mém. Fam. Foug. **8**: 130. 1857, **11**: 71. 1866.
Goniophlebium dulce (Poiret) T. Moore, Ind. Fil. 388. 1862.
? Polypodium aureum var. *mazei* Fourn. ex Duss, Foug. & Lyc. Antill. Franc. 51. 1903.

The above synonymy is very far from complete and may not be entirely accurate in being equated with the Linnaean type. A thorough study of the infraspecific variation included in *Polypodium aureum* will be necessary before the application of names can be done with confidence.

Rhizome creeping, 7–15 mm. thick, densely soft-scaly, the scales linear-attenuate or filiform from a small ovate, dark-centered base, golden- to reddish-brown or tawny, denticulate. Fronds seasonally deciduous; stipes mostly 20–50 cm. long, glossy brown. Blades oblong to subdeltate or ovate-oblong, 30–100 cm. long, 15–50 cm. broad, deeply and coarsely pinnatifid, with a long terminal segment like the lateral ones; segments ligulate or linear-attenuate to lanceolate, 1.5–3.5(–5) cm. broad; veins somewhat irregularly reticulate, many of the areoles with included veinlets, these mostly joined, a few free. Sori located at the junction of two intra-areolate veinlets.

Two rather distinct varieties of *Polypodium aureum* can be recognized in the Lesser Antilles, to be distinguished as follows:

a. Sori in usually 2 rows on either side of the costa, or if apparently but one row, some indication of a second row suggested by a few sori "out of line"; segments often to 3.5 cm. broad; blades green on both sides . . . . 11a. var. *aureum*

a. Sori strictly in 1 row on either side of the costa; segments seldom as much as 2 cm. broad; blades glaucous beneath . . . . 11b. var. *areolatum*

11a. Polypodium aureum var. aureum

General Distribution: Florida, Bahamas, Greater Antilles, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenadines (Bequia, Union, Ronde), Grenada, Barbados.

Habitat: Rocky banks, ledges and tree trunks at lower to middle elevations; plants common.

11b. Polypodium aureum var. areolatum (Humb. & Bonpl. ex Willd.) Baker in Hook. & Baker, Syn. Fil. 347. 1867.

Basionym: *Polypodium areolatum* Humb. & Bonpl. ex Willd. in L., Sp. Pl. **5**: 172. 1810.

Type: *Humboldt & Bonpland, Herb. Willd. 19645*, from Cumana, Venezuela (B).

Syn.: *Goniophlebium areolatum* (Hunb. & Bonpl. ex Willd.) C. Presl, Tent. Pter. 186. 1836.
Phlebodium areolatum (Humb. & Bonpl. ex Willd.) J. Smith in J. Bot. Hook. **4**: 59. 1841.
? Polypodium aureum var. *reductum* Jenman, Ferns Br. W. Ind. & Guiana 292. 1909.

General Distribution: Greater Antilles, continental tropical America, Galapagos Islands.

Distribution in Lesser Antilles: Guadeloupe, *Scamman 8166* (GH).

Habitat: Epiphytic at chiefly middle elevations; plants very rare in the Lesser Antilles, but common in South America.

12. Polypodium decumanum Willd. in L., Sp. Pl. 5: 170. 1810.

Type: *Hoffmannsegg, Herb. Willd. 19640*, from Brazil (B).

Syn.: *Phlebodium decumanum* (Willd.) J. Smith in J. Bot. Hook. **4**: 59. 1841.
Chrysopteris decumana (Willd.) Fée, Mém. Fam. Foug. **5**: 265. 1852.

Rhizome creeping, 7–15 mm. thick, densely clothed with soft, lustrous, pale reddish-brown, linear-filiform scales. Fronds few, spreading, 1–2 m.

long; stipes stout, glabrous, 5–10 mm. thick, shorter than the blades. Blades broadly oblong, 25–60 cm. broad, subpinnatisect at the base, deeply pinnatifid toward the apex, with a broad, elongate terminal segment; segments ligulate to broadly oblong-lanceolate, 3–7 cm. broad, usually slightly constricted above the dilated base, the cartilaginous margins sinuate or repand-crenate, with sinuses minutely toothed. Sori small, in mostly 4–7 series, each sorus borne on a receptacle that terminates 2 or 3 parallel included veinlets.

General Distribution: Greater Antilles except Cuba; Trinidad, continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, Martinique.

Habitat: Epiphytic on large trees at low elevations; plants rare.

Subgenus MICROGRAMMA

Key to the Species

a. Frond tissue bearing numerous minute peltate scales (these deciduous with age); paraphyses numerous, much longer than the sporangia, conspicuous . . . . . 13. *P. piloselloides*
a. Frond tissue without scales; paraphyses inconspicuous.
  b. Rhizome filiform, 0.3–1.5 mm. thick; blades of thin texture . . . . . 14. *P. heterophyllum*
  b. Rhizome cordlike, 2–4 mm. thick; blades of leathery texture.
    c. All fronds linear-lanceolate, 5–20 cm. long, glabrous, rhizome scales 1 mm. broad at point of attachment . . . . . 15. *P. lycopodioides*
    c. Sterile fronds rotund or very broadly ovate, rounded at the apex, 1–5 cm. long, sparsely and minutely woolly-tomentose; fertile fronds linear and much longer than the sterile; rhizome scales 0.5 mm. broad at point of attachment . . . . . 16. *P. vacciniifolium*

13. Polypodium piloselloides L., Sp. Pl. **2**: 1083. 1753.

Type: linn *1251.3*, from "America meridionali." Linnaeus also cited Plumier, Tr. Foug. 103, *t. 118*, and Petiver, Pter. Amer. *t. 10, fig. 5*, both representing a plant from Morne Rouge, Martinique.

Syn.: *Marginaria piloselloides* (L.) C. Presl, Tent. Pter. 187. 1836.
Goniophlebium piloselloides (L.) J. Smith ex Hook., Gen. Fil. *under t. 51.* 1840.
Craspedaria piloselloides (L.) Fée, Mém. Fam. Foug. **5**: 264. 1852.
Lopholepis piloselloides (L.) J. Smith in Seem., Bot. Voy. Herald 229. 1854.
Lepicystis piloselloides (L.) Diels in Engl. & Prantl, Nat. Pflanzenfam. 1(4): 323. 1899.
Microgramma piloselloides (L.) Copel., Gen. Fil. 185. 1947.

Rhizome wide-creeping, 0.5–1 mm. thick, scaly, the scales thin, light brown, lance-linear, 3–4 mm. long, attenuate and falcate. Fronds distant, subdimorphic; stipes 2–18 mm. long, slender, scaly. Sterile blades elliptic to ovate or ovate-oblong, 2–5 cm. long, 1–2 cm. broad, opaque. Fertile blades lance-linear, 3.5–8 cm. long, 0.4–1 cm. broad. Sori relatively large, with numerous elongate hairlike paraphyses.

General Distribution: Greater Antilles, Guatemala, northern South America from French Guiana to Eucador. Closely related forms are widespread in continental tropical America.

Distribution in Lesser Antilles: St. Martin, Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On stone walls, mossy boulders, and tree trunks at lower to middle elevations.

14. **Polypodium heterophyllum** L., Sp. Pl. 2: 1083. 1753.

Lectotype: Plumier, Tr. Foug. *t. 120*, based on material from "en venant des Anses a Pitre à Léogane," Haiti. Specimens marked *P. heterophyllum* in the Linnaean Herbarium (numbers *1251.4* and *1251.56*) represent two unrelated species. The first of these is in fact *P. heterophyllum*, but neither specimen fits the diagnosis in *Species Plantarum*.

Syn.: *Polypodium serpens* Sw., Prodr. 131. 1788, not G. Forster, 1786. (Type from Jamaica.)
Polypodium exiguum Heward in Mag. Nat. Hist. II, 2: 458. 1838, not Griseb., 1864, nor Fée, 1869. (Type from Jamaica.)
Anapeltis serpens (Sw.) J. Smith, Cat. Cult. Ferns 5. 1857.
Polypodium swartzii Baker in Hook. & Baker, Syn. Fil. 357. 1868.
Phymatodes exiguum (Heward) L. M. Underw. in Torreya 3: 18. 1903.
Phymatodes heterophylla (L.) Small, Ferns of Florida 81. 1932.
Microsorium heterophyllum (L.) A. D. Hawkes in Amer. Fern J. 41: 52. 1951.
Craspedaria heterophylla (L.) Diddell in Amer. Fern J. 43: 114. 1953.

Rhizome wide-creeping, densely scaly, the scales linear-attenuate, 5–7 mm. long, tawny to reddish-brown, denticulate, peltately attached far above the narrowed base. Fronds distantly attached, extremely variable, glabrous; stipes nearly absent or up to 15 mm. long, marginate, naked. Sterile blades oval or elliptic and 1–3 cm. long, or lanceolate to linear and 3–12 cm. long, 1–1.5 cm. broad at the middle, narrowed at both ends, with margins variously undulate, sinuate, or (rarely) irregularly crenate to deeply incised. Fertile blades mostly narrower than the sterile, and up to 16 cm. long. Sori medial, each located at the end of a free areolar veinlet; paraphyses brown, few, hairlike but more than 1 cell wide at base.

General Distribution: Florida, Bahamas, Greater Antilles, Virgin Islands.

Distribution in Lesser Antilles: St. Martin, St. Barthelemy, Antigua, Saba, St. Eustatius, Montserrat.

Habitat: Climbing on bushes or small trees, or sometimes on limestone rocks, at chiefly lower elevations.

15. **Polypodium lycopodioides** L., Sp. Pl. 2: 1082. 1753.

Type: LINN *1251.2*, from an unknown locality. Linnaeus cited "Martinica, Domingo, Jamaica," probably all on the basis of collateral references.
Syn.: *Pleopeltis lycopodioides* (L.) C. Presl, Tent. Pter. 193. 1836.
Phlebodium lycopodioides (L.) J. Smith ex Hook. in Comp. Curt. Bot. Mag. **72**: 12. 1846.
Drynaria lycopodioides (L.) Fée, Mém. Fam. Foug. **5**: 270. 1852.
Anapeltis lycopodioides (L.) J. Smith, Cat. Cult. Ferns 6. 1857.
Niphobolus lycopodioides (L.) Keys., Pol. Cyath. Herb. Bung. 38. 1873.
Phymatodes lycopodioides (L.) Millsp. in Field Mus. Bot. ser. **3**: 12. 1903.
Microgramma lycopodioides (L.) Copel., Gen. Fil. 185. 1947.

Numerous other synonyms exist, but are based on other types and do not pertain to the Lesser Antilles.

Rhizome wide-creeping, densely scaly, the scales lance- or linear-attenuate, hair-pointed, 6–10 mm. long, reddish-brown but becoming bicolorous with age, laxly ciliate, peltately attached. Fronds distant, subdimorphic; stipes very short or lacking. Sterile blades linear-lanceolate to ligulate, 5–20 cm. long, 1–2.5 cm. broad, narrowed at both ends, the margins entire or slightly sinuate. Fertile blades elliptic to linear, 0.5–1.5 cm. broad. Sori medial or supramedial, each terminal on an included areolar veinlet.

GENERAL DISTRIBUTION: Pantropical.

DISTRIBUTION IN LESSER ANTILLES: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

HABITAT: On rocks and tree trunks at lower to middle elevations.

16. **Polypodium vacciniifolium** Langsd. & Fischer, Ic. Fil. 8, *t. 7.* 1810.

Type: *Langsdorf 6/7*, from Santa Catarina Island, Brazil (LE).
Syn.: *Marginaria vacciniifolia* (Langsd. & Fischer) C. Presl, Tent. Pter. 188. 1836.
Goniophlebium vacciniifolium (Langsd. & Fischer) J. Smith ex Hook., Gen. Fil. *under t. 51.* 1840.
Craspedaria vacciniifolia (Langsd. & Fischer) Link, Fil. Hort. Berol. 117. 1841.
Anapeltis vacciniifolia (Langsd. & Fischer) J. Smith, Cat. Cult. Ferns 6. 1857.
Lopholepis vacciniifolia (Langsd. & Fischer) J. Smith, Ferns Brit. & For. 85. 1866.
Niphobolus vacciniifolius (Langsd. & Fischer) Keys., Pol. Cyath. Herb. Bung. 38. 1873.
Lepicystis vacciniifolia (Langsd. & Fischer) Diels in Engl. & Prantl, Nat. Pflanzenfam. 1(4): 323. 1899.

Microgramma vacciniifolia (Langsd. & Fischer) Copel., Gen. Fil. 185. 1947.

Rhizome wide-creeping and copiously branching, densely scaly, the scales peltate, yellow-brown, mostly 3–5 mm. long, with narrowly lanceolate base and filiform apex. Fronds distant, strongly dimorphic, exstipitate. Fertile fronds linear, 3–11 cm. long, 2–7 mm. broad, entire, blunt to acute at the apex, long-decurrent at base, the margins somewhat revolute, the venation reticulate, obscure. Sori small, medial, bearing a few flattened, flexuous, brownish, hairlike paraphyses.

General Distribution: Tobago, Trinidad, South America to Argentina.

Distribution in Lesser Antilles: Grenada.

Habitat: On tree trunks at low elevations.

Subgenus PLEOPELTIS

17. **Polypodium astrolepis** Liebm. in Dansk. Vid. Selsk. Skr. V, 1: 185. 1849.

Type: *Liebmann s.n., in 1841*, from Trapiche de la Concepcion, Oaxaca, Mexico (GH, fragment).

Syn.: *Grammitis lanceolata* Schkuhr, Krypt. Gew. 1: 9, *t. 7*. 1804, not *Polypodium lanceolatum* L., 1753.

Grammitis elongata Sw., Syn. Fil. 22, 213. 1806, not *Polypodium elongatum* Aiton, 1789.

Drynaria prieurii Fée, Mém. Fam. Foug. 5: 271. 1852. (Syntypes from French Guiana and Martinique.)

Polypodium elongatum (Sw.) Mettenius in Abh. Senck. Nat. Ges. Frankfurt 2: 88, *t. 2, figs. 8, 9*. 1857, not Aiton, 1789, nor Schrader, 1818.

Gymnogramma elongata (Sw.) Hook., Sp. Fil. 5: 157. 1864.

Pleopeltis astrolepis (Liebm.) Fourn. in Besch. & Nyl., Mex. Pl. 1: 87. 1872.

Taenitis swartzii Jenman in J. Bot. 17: 263. 1879. (Based on *Grammitis elongata* Sw.)

Polypodium lanceolatum var. *elongatum* (Sw.) Krug in Engl. Bot. Jahrb. 24: 131. 1897.

Polypodium prieurii (Fée) Christ in Pittier, Prim. Fl. Costaric. 3: 17. 1901.

Polypodium lanceolatum sensu Duss, Foug. & Lyc. Antill. Franc. 40. 1903, not L., 1753.

Phlebodium astrolepis (Liebm.) Conzatti, Fl. Taxon. Mex. 1: 100. 1939.

Rhizome wide-creeping, 0.5–1 mm. thick, bearing round, peltate, blackish scales, these 1 mm. or less in diameter, often nearly concealed by the brown, clustered trichomes, thus giving the impression of a merely hairy rhizome. Fronds distant; stipes 0.5–2 cm. long, dark, flattish, narrowly green-marginate. Blades linear to lance-linear or oblanceolate, mostly 7.5–20 cm. long, 0.7–1.8 cm. broad, narrowed toward both ends, of thick, opaque texture and hygroscopic; tissue with minute, lacerate-stellate scales and obscure venation. Sori 2–10 mm. long, approximately medial.

GENERAL DISTRIBUTION: Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to South America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On shaded rocks and tree trunks in moist areas from low to high elevations.

Subgenus CAMPYLONEURUM

KEY TO THE SPECIES

a. Rhizome elongate, less than 4 mm. thick, bearing scattered fronds; apex of blade acuminate . . . . 18. *P. repens*
a. Rhizome short-creeping, mostly 4–15 mm. thick, the fronds rather densely clustered; apex of blade acute.
  b. Blades less than 2 cm. broad . . . . 19. *P. angustifolium*
  b. Blades more than 4 cm. broad.
    c. Blades gradually attenuate below, flat, the tissue yellow-green; stipes relatively short or nearly lacking . . . . 20. *P. phyllitidis*
    c. Blades abruptly attenuate below, the margins more or less wrinkled-undulate, the tissue dark green; stipes relatively long . . 21. *P. latum*

18. Polypodium repens Aubl., Hist. Pl. Guian. 2: 962. 1775.

Type: *Aublet*, from French Guiana. Together with his very short diagnosis, Aublet also cited Plumier, Tr. Foug. 117, *t. 134*, representing a plant from Hispaniola that is unquestionably our present species.

Syn.: *Campyloneurum repens* (Aubl.) C. Presl, Tent. Pter. 190. 1836.
Cyrtophlebium repens (Aubl.) J. Smith in J. Bot. Hook. 4: 58. 1841.
Polypodium phyllitidis [var.] *β repens* (Aubl.) Griseb., Fl. Br. W. Ind. 702. 1864.

Rhizome wide-creeping, sometimes pendent, 1–3.5 mm. thick, green or blackish, deciduously scaly, the scales deltate-acuminate, 2–3.5 mm. long, light brown, clathrate, glabrous. Fronds distant, glabrous; stipes 3–15 cm. long, deeply grooved adaxially, straw-colored, glabrous and deciduously scaly. Blades linear- to oblong-lanceolate, mostly 15–60 cm. long, 3–9 cm. broad below the middle, sharply acuminate at the apex, cuneate and shortly decurrent at base, the margins entire or slightly sinuate; side-veins moderately prominent, oblique, parallel, connected by broadly arching cross-veins, the costal areoles each with a single included free veinlet, the other areoles with two. Sori small, terminating free veinlets, thus 2-seriate between the main veins.

General Distribution: Jamaica, Hispaniola, Belize, Costa Rica, northern South America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: Climbing on rocks and tree trunks in moist forests and ravines at chiefly middle elevations.

19. **Polypodium angustifolium** Sw., Prodr. 130. 1788.

Type: *Swartz*, from Jamaica.
Syn.: *Marginaria angustifolia* (Sw.) C. Presl, Tent. Pter. 188. 1836.
Grammitis angustifolia (Sw.) Heward in Mag. Nat. Hist. II, **2**: 458. 1838.
Cyrtophlebium angustifolium (Sw.) J. Smith ex Hook. in Comp. Curt. Bot. Mag. **72**: 12. 1846.
Campyloneurum angustifolium (Sw.) Fée, Mém. Fam. Foug. **5**: 257. 1852.
Goniophlebium angustifolium (Sw.) Brack. in Wilkes, Expl. Exp. **16**: 33. 1854.

Rhizome short-creeping, 3–7 mm. thick, nodose, usually pruinose, deciduously scaly, the scales ovate-attenuate, 2–3.5 mm. long, light to dark brown, clathrate, glabrous. Fronds crowded, ascending, spreading or pendent, nearly exstipitate. Blades narrowly linear, 20–70 cm. long, mostly 0.3–1.5 cm. broad, the apex subulate-falcate, the base long-decurrent, the margins entire, revolute; texture rigid-leathery, the veins joined in 1 or 2 rows of irregular areoles, each with 1 or 2 included free veinlets. Sori 1- to 2-seriate, each terminal on a free areolar veinlet.

General Distribution: Florida, Greater Antilles, continental tropical America. Several more or less distinct variants occur.

Distribution in Lesser Antilles: Guadeloupe, *Mazé "601, 869"* (IJ), *Duss 4103*.

Habitat: Rocky banks and tree trunks at low to middle elevations; plants very rare in the Lesser Antilles.

20. **Polypodium phyllitidis** L., Sp. Pl. 2: 1083. 1753.

Lectotype: Plumier, Descr. Pl. Amer. *t. 38* (= Tr. Foug. *t. 130*), based on material from the "Antilles" without precise locality. The specimen named *P. phyllitidis* in the Linnaean Herbarium (number *1251.5*) is in fact *P. crassifolium* and was undoubtedly a later insertion, misidentified by Linnaeus himself.
Syn.: *Campyloneurum phyllitidis* (L.) C. Presl, Tent. Pter. 190, *t. 7, figs. 18–20*. 1836.
Cyrtophlebium phyllitidis (L.) J. Smith in J. Bot. Hook. **4**: 58. 1841.

Rhizome short-creeping, 5–8 mm. thick, scaly at the apex and enveloped in a mass of brown-tomentose rootlets, the scales appressed-imbricate, ovate-oblong or broadly ovate, 2–6 mm. long, acute to acuminate, gray-brown, clathrate, glabrous. Fronds clustered, nearly exstipitate or with a short stipe 1–5(–10) cm. long, passing gradually upward into the long-decurrent blade. Blades ligulate, narrowly oblong-linear, or lance-linear, mostly 30–120 cm. long, 4–8 cm. broad at the middle, tapering gradually both ways, sharply acute at the apex, light green, the margins cartilaginous, not undulate; tissue stiffly papery in texture, the principal veins ascending, joined by rather obscure arching cross-veins, the areoles mostly with 2 or 3 included free veinlets, one of these often prolonged and joined to the next cross-vein, forming secondary areoles. Sori 2-seriate between the main lateral veins.

General Distribution: Florida, Bahamas, Greater Antilles, Virgin Islands, Tobago, Trinidad, continental tropical America.

Distribution in Lesser Antilles: St. Martin, Antigua, Saba, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Marie Galante, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, Barbados.

Habitat: On trees, rocky banks, boulders, and shaded cliffs at low to middle elevations; plants frequent.

21. **Polypodium latum** (T. Moore) T. Moore ex Sodiro, Crypt. Vasc. Quit. 371. 1894; Hieron. in Engl. Bot. Jahrb. 22: 405. 1896.

Basionym: *Campyloneurum latum* T. Moore, Ind. Fil. 225. 1861.
Lectotype: *Guilding*, from St. Vincent (K), now first selected from Moore's numerous syntypes.
Syn.: *Polypodium phyllitidis* var. *β latum* (T. Moore) Hook., Sp. Fil. 5: 38. 1863.
Polypodium phyllitidis f. *latum* (T. Moore) Proctor in Bull. Inst. Jamaica Sci. Ser. 5: 49. 1953.

Rhizome short-creeping, to 10 mm. thick, often branched and strongly nodose, enveloped in a dense mass of rootlets, the scales few, appressed, light brown, roundish-ovate, obtuse, finely subclathrate, glabrous. Fronds closely clustered; stipes stout, 5–15 cm. long, subquadrangular. Blades broadly ligulate, elliptic, or oblanceolate, to 100 cm. long and mostly 5–13 cm. broad, abruptly acute at the apex, short- to long-cuneate at base, dark green, the margins cartilaginous and usually undulate; tissue stiffly papery, the surface often transversely corrugate, the principal veins prominent, oblique-spreading, joined by numerous irregularly arching cross-veins, the areoles usually with several included veinlets, these variously combined to form secondary areoles in 3 or 4 rows, an intermediate lateral vein sometimes developed. Sori in 2–4 series between the main lateral veins.

General Distribution: Florida, Greater Antilles, Trinidad, continental tropical America from Mexico to Colombia and Venezuela.

Distribution in Lesser Antilles: Saba, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada, Barbados.

Habitat: On rocks and tree trunks at low to middle elevations; plants not common.

The relationship between *Polypodium latum* and *P. phyllitidis* needs further study. Although occasional specimens are difficult to determine as one or the other, when well developed they are quite distinct; their contrasting appearance is very evident when they are growing together.

Subgenus NIPHIDIUM [6]

22. Polypodium crassifolium L., Sp. Pl. **2**: 1083. 1753.

Lectotype: Petiver, Pter. Amer. *t. 6, fig. 1*, copied from Plumier, Tr. Foug. *t. 142*, based on material from Morne de la Calebasse, Martinique (selected by Lellinger in Amer. Fern J. **62**: 106. 1972).

Syn.: *Phymatodes crassifolia* (L.) C. Presl, Tent. Pter. 197. 1836.
Drynaria crassifolia (L.) J. Smith in J. Bot. Hook. **4**: 61. 1841.
Dipteris crassifolia (L.) J. Smith in London J. Bot. **1**: 196. 1842.
Pleuridium crassifolium (L.) Fée, Mém. Fam. Foug. **5**: 274. 1852.
Pleopeltis crassifolia (L.) T. Moore, Ind. Fil. lxxviii. 1857.
Pessopteris crassifolia (L.) L. M. Underw. & Maxon in Contr. U. S. Nat. Herb. **10**: 485. 1908.
Niphidium crassifolium (L.) Lellinger in Amer. Fern J. **62**: 106. 1972.

Rhizome woody, short-creeping, 5–15 mm. thick, enveloped in a dense mass of rootlets, and clothed with scales at the apex, the scales imbricate, lance- to ovate-acuminate, 8–12 mm. long, bicolorous with a blackish central band and pale subentire margins, finely clathrate. Fronds few, close, stiffly erect, to 1.3 m. long; stipes stout, 5–15 cm. long (rarely more), broadly grooved on adaxial side, narrowly green-marginate. Blades narrowly oblanceolate or ligulate, mostly 4–14 cm. broad, rounded to abruptly acute at the apex, attenuate at base, the margins cartilaginous; tissue stiff, leathery and opaque, the principal veins oblique, very prominent, 4–10 mm. apart, the minor veins forming areoles, each areole with a simple or branched included veinlet. Sori large and prominent, 1.5–3.5 mm. in diameter or more, arising from an irregular ring of united veinlets, uniseriate and medial between the principal veins, mostly confined to the upper half of the blade.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to Peru, Bolivia, and Brazil.

Distribution in Lesser Antilles: Saba, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Barbados.

Habitat: Shaded rocks and tree trunks at lower to middle elevations.

Doubtful Records

Polypodium ampliatum (Maxon) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 45. 1953, is a name applied to a population best represented in Cuba, but some specimens from the Lesser Antilles (e.g., Montserrat,

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[6] *Polypodium* subg. *Niphidium* (Lellinger) Proctor, stat. nov., based on *Niphidium* Lellinger in Amer. Fern J. **62**: 103. 1972.

Shafer 754 (NY)) are very similar. However, the characters separating *P. ampliatum* and *P. triseriale* are not well correlated, and in the present treatment I have included all the Lesser Antillean material under *P. triseriale.* In further study of this group, one must also take into consideration the forms usually called *P. attenuatum* Humb. & Bonpl. ex Willd., which occur widely from Mexico to northern South America. It is possible that all these plants should be considered variants of one wide-ranging species.

Polypodium decurrens Raddi was reported from Martinique by Duss (Foug. & Lyc. Antill. Franc. 42. 1903) on the basis of a specimen (*Duss 1568*) he collected, which I have not seen. There is a possibility that the plant illustrated by Plumier (Tr. Foug. 99, *t. 114*) as *Lingua cervina quinquefolia, foliis acuminatis et pediculis squammosis* may have been a form of this species. Plumier's plant was found at Morne Rouge, Martinique.

Polypodium otites L., Sp. Pl. 2: 1085. 1753, was recorded from Guadeloupe by Fée (Mém. Fam. Foug. 11: 46. 1866), but it seems probable that his plant was not true *P. otites.* This specific epithet was erroneously applied by Willdenow and Hooker to a form of *P. pectinatum,* and Fée may have been using the name in that sense. So far as is definitely known, *P. otites* occurs only in Cuba, Jamaica, and Hispaniola in the West Indies.

Polypodium recurvatum Kaulf., Enum. Fil. 106. 1824, was recorded from Guadeloupe by Duss (Foug. & Lyc. Antill. Franc. 46. 1903) on the basis of his specimen number *4093.* I have not seen his material, and therefore cannot evaluate this report. *P. recurvatum* is otherwise known chiefly from Brazil.

NEURODIUM Fée

Neurodium Fée in Mém. Soc. Mus. Hist. Nat. Strasbourg 4: 201. 1850 (as *Nevrodium*). FIGURE 58.

Syn.: *Paltonium* C. Presl, Epim. Bot. 156. 1851.

A rather small epiphytic fern. Rhizomes creeping, usually immersed in a mass of hairy roots, bearing scales at the apex. Fronds close, articulate. Blades simple, entire, elongate, glabrous or nearly so, of leathery, semi-opaque texture, costate to the apex, the venation deeply immersed, reticulate, with areoles elongate-hexagonal, mostly with a simple or forked included free veinlet. Sori linear, inframarginal, without indusium, borne along the outer side of the outermost vein areoles, and confined to the upper part of the blade (this part usually somewhat contracted); filamentous paraphyses sometimes present. Sporangia with annulus of about 13 cells; spores bilateral, minutely tuberculate.

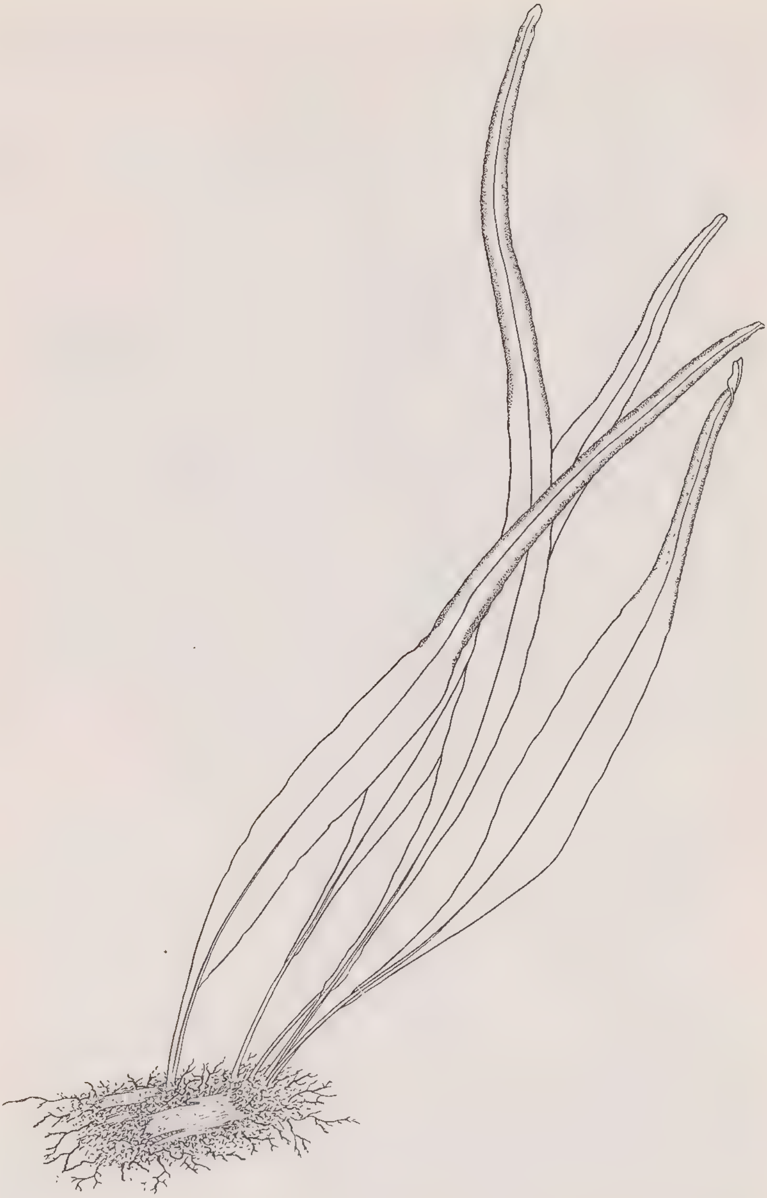

FIGURE 58. **Neurodium.** a, *N. lanceolatum*, habit, showing the sporangia aggregated in elongate marginal coenosori toward the tips of the blades, × 0.5.

Type species: *Neurodium lanceolatum* (L.) Fée, based on *Pteris lanceolata* L., of the American tropics. Asiatic plants that have sometimes been referred to this genus apparently are not related.

1. **Neurodium lanceolatum** (L.) Fée, Mém. Fam. Foug. **3**: 28. 1852.

Basionym: *Pteris lanceolata* L., Sp. Pl. **2**: 1073. 1753.
Type: *Plumier*, Descr. Pl. Amer. *t. 41* (= Tr. Foug. *t. 132*), based on a plant from Hispaniola.
Syn.: *Taenitis lanceolata* (L.) Kaulf., Enum. Fil. 130. 1824.
Pteropsis lanceolata (L.) Desvaux in Mém. Soc. Linn. Paris **6**: 218. 1827.
Paltonium lanceolatum (L.) C. Presl, Epim. Bot. 156. 1851.
Heteropteris lanceolata (L.) Diels in Engl. & Prantl, Nat. Pflanzenfam. **1**(4): 305. 1899.

Characters of the genus; rhizome scales deltate-ovate, blackish-brown, reticulate-opaque with pale brown, denticulate margins. Fronds 20–40 cm. long with very short stipes (1–5 cm.). Blades 1.5–4 cm. broad at the middle, tapering toward both ends. Sori 2–3 mm. broad.

General Distribution: Florida, Greater Antilles, Virgin Islands, Belize, Guatemala, Honduras, French Guiana.

Distribution in Lesser Antilles: St. Martin, Antigua, St. Eustatius, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Barbados.

Habitat: On trees at lower to middle elevations.

DICRANOGLOSSUM John Smith

Dicranoglossum J. Smith in Seem., Bot. Voy. Herald 232. 1854.
Figure 59.

Syn.: *Cuspidaria* Fée in Mém. Soc. Mus. Hist. Nat. Strasbourg **4**: 210. 1850, not DeCandolle, 1838.
Eschatogramme Trev. in Atti Ist. Veneto II, **2**: 168. 1851, nomen nudum.

Small epiphytic ferns. Rhizomes short-creeping, minutely scaly, embedded in a dense mass of brown-hairy roots. Fronds closely tufted, articulate to the rhizome, essentially stipeless, coarsely pinnatisect, the few simple or forked segments ligulate- or linear-acuminate, entire; tissue minutely scaly beneath, lacking hairs, the veins obscure, simple or 1- to 2-forked, free or forming areoles near the costa, with tips not reaching the margins and not ending in hydathodes. Sporangia usually aggregated in linear submarginal coenosori confined to the apical portion of the segments, borne on superficial receptacles that connect the vein tips; paraphyses absent. Sporangia with annulus of about 13 cells; spores bilateral, ellipsoid, nearly smooth.

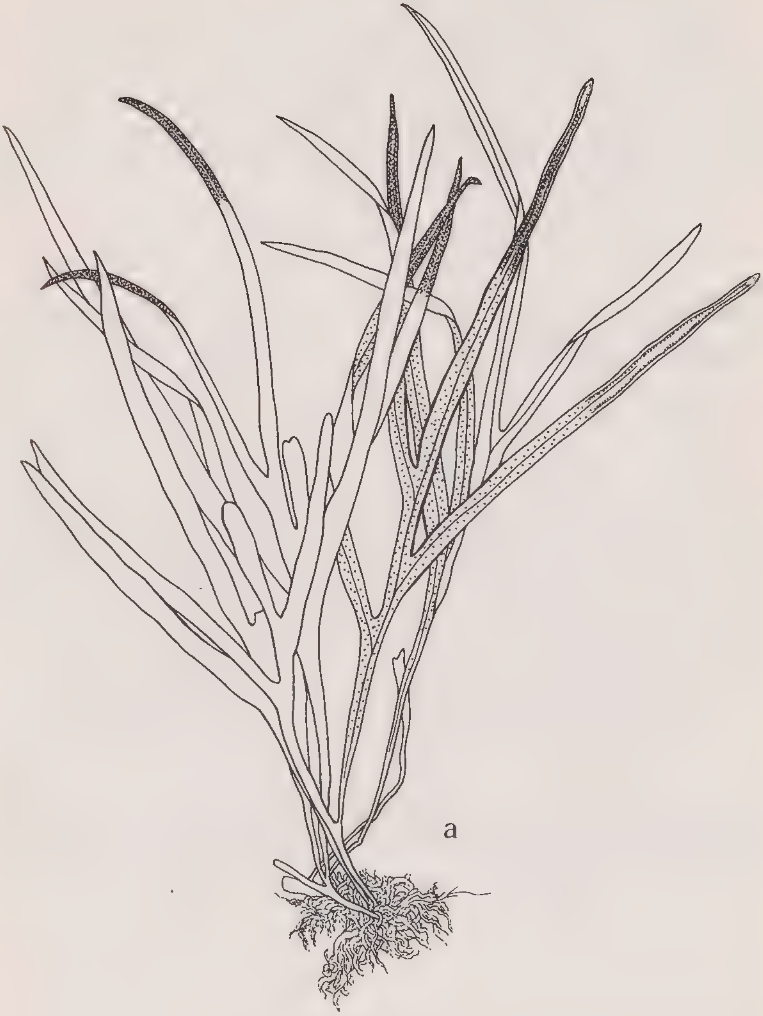

FIGURE 59. **Dicranoglossum.** a, *D. desvauxii*, habit, the sporangia aggregated in linear, submarginal coenosori on apical portions of frond segments, × 0.8.

J.Sm

Type species: *Dicranoglossum furcatum* (L.) J. Smith, based on *Pteris furcata* L. of Hispaniola and Cuba.

A small genus of about four tropical American species, only one being recorded from the Lesser Antilles.

Special literature: Christensen, Taxonomic Fern Studies — I. Revision of the polypodioid genera with longitudinal coenosori (Cochlidiinae and "Drymoglossinae"), with a discussion of their phylogeny, in Dansk. Bot. Ark. 6(3): 34–39. 1929. [As *Eschatogramme.*]

1. **Dicranoglossum desvauxii** (Klotzsch) Proctor in Rhodora **63**: 35. 1961.

Basionym: *Taenitis desvauxii* Klotzsch in Linnaea **20**: 431. 1847, excl. ref. Desvaux.

Lectotype: Hook. & Grev., Ic. Fil. **1**: *t. 7*, based on *Guilding s.n.* from St. Vincent. Christensen (1929) cited *Lockhardt*, from Trinidad, as the source of Hooker and Greville's plate, but the text published with this plate makes it clear that the Lockhardt specimens were received after the plate was prepared. Since the only other material cited (other than Plumier's plate, now referred to a different species) is the Guilding specimen from St. Vincent, typification must necessarily be based on this specimen. Christensen's further reference to Hooker & Greville's *t. 8* is confusing and irrelevant, as that plate illustrates a *Pteris* from Mauritius.

Syn.: *Taenitis furcata* sensu Hook. & Grev., Ic. Fil. **1**: *t. 7*. 1827, not Willd. in L., 1810.
Cuspidaria subpinnatifida Fée, Mém. Fam. Foug. **3**: 26. 1851, **5**: *t. 8-A, fig. 1*. 1852. (Syntypes from St. Vincent and other localities.)
Dicranoglossum subpinnatifidum (Fée) T. Moore, Ind. Fil. 316. 1861.
Eschatogramme desvauxii (Klotzsch) C. Chr. in Dansk. Bot. Ark. **6**(3): 37. 1929.

Characters as given for the genus; distinguished from the other species by regular costal areoles, segments 2–5 mm. broad, and the very small and numerous scales on the tissue.

General Distribution: Trinidad, northern South America to Brazil and Bolivia.

Distribution in Lesser Antilles: St. Vincent.

Habitat: On mossy tree trunks at middle elevations; plants very rare.

Doubtful Record

Drymoglossum martinicense Christ in Engl. Bot. Jahrb. **24**: 137. 1897, described from Montagne du Vauclin, Martinique, on the basis of a specimen collected by Duss (number *250b*), has been shown by Christensen (Dansk. Bot. Ark. 6(3): 42. 1929) to have been founded on a mixture of two Asiatic species, *Cyclophorus adnascens* (Sw.) Desvaux and *Drymoglossum heterophyllum* (L.) Trimen (both probably cultivated or escaped from cultivation). The genus *Drymoglossum* apparently does not occur naturally in the Western Hemisphere. Central and South American material once associated with this taxon (Maxon in Contr. U. S. Nat. Herb. 16: 51, 52, as *Pteropsis*) is now considered to represent an independent, monotypic genus called *Marginariopsis* C. Chr., which does not occur in the Lesser Antilles.

Subfamily GRAMMITIDOIDEAE

Key to the Genera

a. Sori simple, round to oval .... 46. *Grammitis*
a. Sori fused to form elongate coenosori, one on either side of the costa and parallel to it .... 47. *Cochlidium*

GRAMMITIS Swartz

Grammitis Sw. in J. Bot. Schrader 1800(2): 17. 1801.

Figures 60a, 60b.

Very small to moderately-sized epiphytic ferns. Rhizomes short-creeping to erect, bearing scales at the apex. Fronds setose-hairy to nearly or quite glabrous, mostly not articulate to the rhizome, with or without a distinct stipe, and not dimorphic. Blades simple and entire (rarely forked) to lobed, pinnatisect or 1-pinnate (rarely 2-pinnate), usually narrowed at both ends, lacking scales; texture from thin and membranous to rigid, fleshy, or spongiose, the veins of simple blades simple or (more often) forked, free or sometimes casually or regularly reticulate, the veins of pinnatifid or pinnate blades several pairs in each lobe or segment, usually simple, always free. Sori round or oval, often arising from a short-linear receptacle, in small fronds often becoming more or less confluent at maturity (but if so not in grooves), usually 1-seriate (rarely more) on either side of the costa, superficial or somewhat immersed in pits; indusium lacking; paraphyses usually absent. Sporangia with pedicels consisting of one row of cells (except near top); annulus of 8–16 cells; spores globose-tetrahedral, apparently without perispore, usually short-lived.

Type species: *Grammitis marginella* Sw., of Jamaica.

A large, pantropical genus of more than 400 species, best developed in the cool, humid forests of tropical mountains. A total of 22 species are here recorded as occurring in the Lesser Antilles, of which four are endemic.

There has developed a widespread practice of subdividing this taxon into several so-called genera based on the degree to which the blades are cut, e.g., *Grammitis*, with blades simple or lobed less than halfway to the costa, *Xiphopteris*, with blades more deeply lobed or pinnatifid, the segments with midvein simple or with a single branch (and but one sorus), and *Ctenopteris* with pinnatifid or pinnate blades, the segments or pinnae pinnate-veined (producing more than one sorus when fertile). Since in other fern genera such distinctions are scarcely even of subgeneric value when not correlated with other differences, it seems highly inconsistent to view these groups as "genera" in the present case. Morton (1967) has proposed the division of *Grammitis* into "sections" corresponding mainly to these form-groups. To follow this arrangement in the present book would be inconsistent with the treatment of other large genera, in which the concept of subgenera is used for major subdivisions. Very reluctantly, therefore, I am calling these groups subgenera, using Morton's terminology except for uniting his first two sections under one subgenus.

SPECIAL LITERATURE: Maxon, Notes upon *Polypodium duale* and its allies, in Contr. U. S. Nat. Herb. **17:** 398–406, *figs. 8–10* & *t. 11, 12.* 1914; Maxon, *Polypodium trichomanoides* and its American allies, in Contr. U. S. Nat. Herb. **17:** 542–557, *t. 32–38.* 1916; Copeland, The American species of *Xiphopteris*, in Amer. Fern J. **42:** 41–52, *t. 3*, 93–110, *t. 8–10.* 1952; Copeland, *Grammitis*, in Philip. J. Sci. **80:** 93–271, *t. 1–6, figs. 1–108.* 1952; Copeland, *Ctenopteris* in America, in Philip. J. Sci. **84:** 381–473, *t. 1–16.* 1956; Morton, The validity of the generic name *Ctenopteris*, in Amer. Fern J. **56:** 65–68. 1966; Morton, The genus *Grammitis* in Ecuador, in Contr. U. S. Nat. Herb. **38**(3): 85–123. 1967.

KEY TO THE SUBGENERA

a. Blades simple or forked, the margins entire, never sinuate or lobed ...... Subg. *Grammitis*
a. Blades sinuate, toothed, lobed, pinnatifid, or pinnate.
  b. Sori becoming confluent along the midrib, confined to the taillike apex of the frond; a very small species with toothed rather than pinnatifid blades .... Subg. *Xiphopteris* (*Grammitis serrulata*)
  b. Sori all separate and distinct (at least when young); blades sinuate or pinnatifid.
    c. Fertile segments each with one sorus; midvein of segments simple or with one short acroscopic branch .... Subg. *Xiphopteris*
    c. Fertile lobes or segments each with more than one sorus; midvein of frond divisions pinnately branched .... Subg. *Cryptosorus*

Subgenus GRAMMITIS

KEY TO THE SPECIES

a. Margins of blade with black-sclerotic border; blades always simple.
  b. Fronds without stipes; sterile veins simple .... 1. *G. limbata*
  b. Fronds long-stipitate; veins mostly forked, a few anastomosing .... 2. *G. stipitata*
a. Margins of blade green, not black-sclerotic; blades usually dichotomously forked .... 3. *G. furcata*

1. **Grammitis limbata** Fée, Mém. Fam. Foug. **5**: 233. 1852, **6**: 6, *t. 5, fig. 1.* 1853.

Type: *Perrotet in 1824*, from Guadeloupe.
Syn.: *Grammitis marginella* sensu Duss, Foug. & Lyc. Antill. Franc. 57. 1903, not Sw., 1801.
Polypodium limbatum (Fée) Maxon in Bull. Torrey Bot. Club **42**: 222. 1915.

Rhizome short, erect, with scales lance-linear, 2–4 mm. long, yellow-brown, not clathrate. Fronds clustered, few, glabrous, exstipitate. Blades ligulate, mostly 7–15 cm. long, 4–7 mm. broad, acute at the apex, tapering below the middle, the sterile veins simple, parallel, not reaching the margins, the fertile veins with a very short acroscopic spur entirely covered by the sorus. Sori oval, inframedial, separate, not touching the costa.

General Distribution: Jamaica.

Distribution in Lesser Antilles: Guadeloupe, Dominica, St. Vincent.

Habitat: On mossy trees at high elevations; plants very rare.

2. **Grammitis stipitata** Proctor in Rhodora **68**: 467. 1966.

Type: *E. A. Marie 6*, from Guadeloupe (P; isotypes BM, IJ, NY).

Rhizome short, decumbent or erect, with scales deltate-attenuate, to 3 mm. long, yellow-brown, subclathrate. Fronds clustered, of stiff texture; stipes 4–6 cm. long, narrowly marginate above, hirtellous throughout with small spreading pluricellular hairs. Blades narrowly lanceolate to lance-linear, 8.5–11 cm. long, to 1.1 cm. broad below the middle, narrowed-acute at the apex, cuneate at base; costa beneath and the black-sclerotic margins sparsely hirtellous like the stipe, the veins mostly 1- to 2-forked, free or a few casually joined at the tips, none reaching the margins. Sori oval, inframedial, separate, located on a short acroscopic spur of the first distal vein fork, not touching the costa. Sporangia glabrous.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: Guadeloupe.

Habitat: Not recorded, but undoubtedly on mossy trees at high elevations.

This species is known only from the type collection. Copeland alluded to it as "an abnormal form of *G. limbata*" (Philip. J. Sci. **80**: 258. 1952), but in fact it is very different from that species.

3. **Grammitis furcata** Hook. & Grev., Ic. Fil. **1**: *t. 62.* 1828.

Type: *C. S. Parker*, from British Guiana (now Guyana).
Syn.: *Polypodium furcatum* (Hook. & Grev.) Mettenius in Abh. Senck. Nat. Ges. Frankfurt **2**: 34. 1857, not Sw., 1801, Desvaux, 1827, nor Roxb., 1844.

Polypodium dicranophyllum C. Chr., Ind. Fil. 331, 522. 1905.
Cochlidium furcatum (Hook. & Grev.) C. Chr. in Dansk. Bot. Ark. 6(3): 30. 1929.

Rhizome small, bearing reddish-brown attenuate scales to 5 mm. long. Fronds densely tufted, glabrous, exstipitate, mostly 5–9 cm. long; divisions linear, ca. 2 mm. broad, blunt at the apex, attenuate below to the narrowly marginate base, with veins all simple, not reaching the margins. Sori oval, small, terminal on veins, widely separate.

General Distribution: Jamaica, Trinidad, South America.

Distribution in Lesser Antilles: Grenada, *Sherring s.n.* (B, K).

Habitat: On mossy tree trunks at high elevations; plants very rare.

Subgenus XIPHOPTERIS

Key to the Species

a. Sori becoming confluent along the costa, confined to the taillike apex of the frond; rhizome elongate, filiform; blades seldom over 1.5 mm. broad .... 4. *G. serrulata*

a. Sori essentially all separate and distinct, the blade not differentiated into a taillike apical portion; rhizome short, or if somewhat elongate not filiform; blades more than 2 mm. broad.
  - b. Vein of each segment simple (a short fertile spur sometimes visible in *G. serricula*).
    - c. Rhizome scales clathrate and without pluricellular teeth; long red setae absent from the frond tissue.
      - d. Rhachis and frond tissue minutely puberulous beneath (especially when young), the hairs whitish; segments narrowly oblong; sori elliptic .... 5. *G. hartii*
      - d. Rhachis beneath bearing short, stiff red setae (each from a glandular base), otherwise the blade glabrous beneath; segments deltate-oblong; sori round .... 6. *G. nutata*
    - c. Rhizome scales not clathrate, their margins bearing a few irregular, pluricellular teeth; frond tissue bearing long red setae .... 7. *G. serricula*
  - b. Veins of the fertile segments (and sometimes also of the sterile ones) distinctly forked.
    - e. Blades nearly glabrous, never setose with stiff reddish hairs; fertile segments gibbous (lobed on acroscopic side); blades not over 2.5 cm. long .... 8. *G. grisebachii*
    - e. Blades always reddish-setose, the hairs usually long; segments gibbous or not.
      - f. Rhizome scales glabrous, nearly entire or bearing a few irregular marginal teeth.
        - g. Fronds distinctly stipitate; blades mostly 2–5.5 mm. broad; veins of sterile segments always simple ...... 7. *G. serricula*
        - g. Fronds nearly exstipitate (stipes 1–3 mm.), the blades decurrent below to a winged base; blades 6–13 mm. broad; veins of all segments forked .... 9. *G. knowltoniorum*

f. Rhizome scales with numerous bristlelike cilia; blades mostly 4–7 mm. broad, the numerous oblong segments noticeably paler beneath than above .... 10. *G. taenifolia*

4. Grammitis serrulata (Sw.) Sw. in J. Bot. Schrader **1800**(2): 18. 1801.

Basionym: *Acrostichum serrulatum* Sw., Prodr. 128. 1788.
Type. *Swartz*, from Jamaica.
Syn.: *Asplenium serrulatum* (Sw.) Sw., Fl. Ind. Occ. **3**: 1607. 1806.
Gymnopteris serrulata (Sw.) Bernh. in Neues J. Bot. Schrader **2**(2): 48. 1806.
Xiphopteris serrulata (Sw.) Kaulf., Enum. Fil. 85. 1824.
Micropteris serrulata (Sw.) Desvaux in Mém. Soc. Linn. Paris **6**: 217. 1827.
Polypodium serrulatum Mettenius, Fil. Hort. Lips. 30. 1856, not Sw., 1801.
Xiphopteris extensa Fée, Mém. Fam. Foug. **11**: 14, *t. 19, fig. 3.* 1866. (Type from Guadeloupe.)
Polypodium duale Maxon in Contr. U. S. Nat. Herb. **16**: 61. 1912.

Rhizome elongate, filiform, ascending, with scales deltate-lanceolate, 3–4 mm. long, brown, entire, glabrous. Fronds short-stipitate, 2–10 cm. long. Blades linear, dimorphic, 0.5–1.5(–3) mm. broad, the sterile lower portion deeply serrate nearly to the costa, with segments acute, long-decurrent, the fertile apical portion often curved-falcate, 0.5–5 cm. long, 1–2 mm. broad, flat or folded, with simple veins and serrulate margins. Sori confluent from quite early in their development.

General Distribution: Greater Antilles, Trinidad, continental tropical America, tropical Africa.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On mossy logs or trees or sometimes on moist shaded rocks or humus-filled soil at middle to higher elevations.

5. Grammitis hartii (Jenman) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 33. 1953.

Basionym: *Polypodium hartii* Jenman in J. Bot. **24**: 272. 1886.
Type: *J. H. Hart*, from Jamaica (K).
Syn.: *Xiphopteris hartii* (Jenman) Copel. in Amer. Fern J. **42**: 93. 1952.

Rhizome short, erect, with scales lance-linear to oblong-lançeolate, 1–3 mm. long, mostly 8–12 cells broad, clathrate, the cells mostly broadly oblong. Fronds short-stipitate or nearly sessile. Blades linear, mostly 3.5–12 cm. long, 2.5–5 mm. broad, deeply pinnatifid.

General Distribution: Jamaica, Puerto Rico.

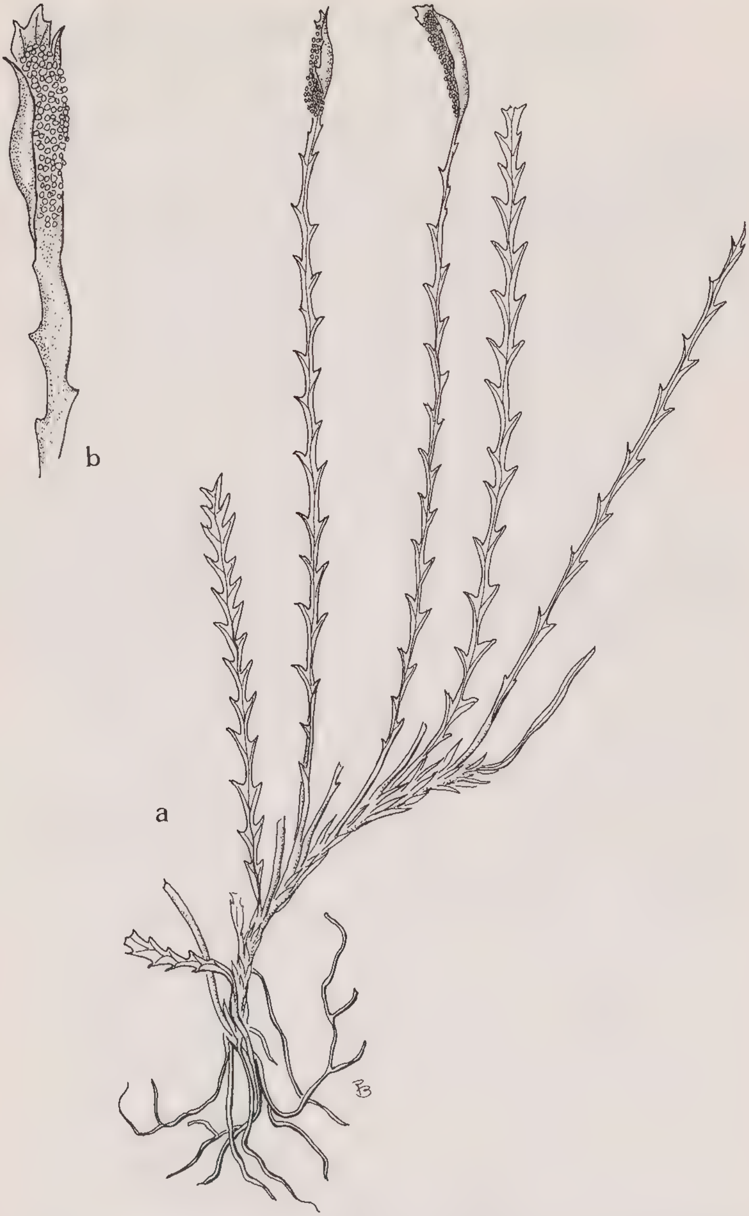

FIGURE 60a. **Grammitis.** a, b, *G. serrulata*: a, habit, × 4.1; b, fertile apical portion, × 7.0.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On mossy trees at middle to higher elevations.

6. **Grammitis nutata** (Jenman) Proctor in Bull. Inst. Jamaica Sci. Ser. 5: 34. 1953.

Basionym: *Polypodium nutatum* Jenman in J. Bot. 24: 272. 1886.
Type: *J. H. Hart*, from Jamaica (K).

Rhizome small, erect, with scales lance-oblong, 1–3 mm. long, 13–20 cells broad, clathrate, the cells mostly elongate-hexagonal (smaller than those of *G. hartii*). Fronds shortly but distinctly stipitate, the stipes 2–6 mm. long. Blades linear, mostly 6–10(–20 ?) cm. long, 2.5–3.5 mm. broad.

General Distribution: Jamaica.

Distribution in Lesser Antilles: St. Vincent.

Habitat: On mossy trees at higher elevations; plants common in St. Vincent.

7. **Grammitis serricula** (Fée) Proctor in Rhodora 63: 35. 1961.

Basionym: *Polypodium serricula* Fée, Mém. Fam. Foug. 5: 238. 1852.
Syntypes: *L'Herminier* and *Perrotet*, both from Guadeloupe.
Syn.: *Xiphopteris serricula* (Fée) Copel. in Amer. Fern J. 42: 101. 1952.

Rhizome small, erect, with scales lanceolate, 2–3.5 mm. long, brown, not clathrate, the cells turgid. Fronds stipitate; stipes 4–25 mm. long, with scattered long reddish setae and minute branched glandular hairs. Blades linear, mostly 6–12 cm. long, 3–6 mm. broad; segments oblong to deltate-oblong, usually not gibbous, with the ends of veins (and often the fertile spurs) visible on the upper side of the segments as distinct hydathodes.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Nevis, Guadeloupe, Dominica, Martinique.

Habitat: On mossy trees at high elevations.

8. **Grammitis grisebachii** (L. M. Underw. ex C. Chr.) Proctor in Bull. Inst. Jamaica Sci. Ser. 5: 33. 1953.

Basionym: *Polypodium grisebachii* L. M. Underw. ex C. Chr., Ind. Fil. 531. 1906. (A renaming of *P. exiguum* Griseb., not Heward.)
Type: *Purdie*, from summit of the Blue Mountains, Jamaica (K).
Syn.: *Polypodium exiguum* Griseb., Fl. Br. W. Ind. 701. 1864, not Heward, 1838.
Xiphopteris grisebachii (L. M. Underw. ex C. Chr.) Copel. in Amer. Fern J. 42: 95. 1952.

Rhizome short or becoming somewhat elongate, often several together growing in a mass, entangled with old persistent stipe bases and embedded in moss, with scales ovate, ca. 0.5 mm. long, acute at apex, lustrous brown, entire, glabrous. Fronds glabrous, stipitate; stipes 2–7 mm. long. Blades oblong-linear, mostly 1.5–2.5 cm. long, 2–3 mm. broad, narrowed toward the base.

GENERAL DISTRIBUTION: Jamaica.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: On mossy tree trunks at high elevations; plants very rare.

This is the smallest species of *Grammitis* occurring in the Lesser Antilles.

9. **Grammitis knowltoniorum** (Hodge) Proctor in Rhodora **63**: 35. 1961.

Basionym: *Polypodium knowltoniorum* Hodge in Amer. Fern J. **31**: 105, *t. 1, figs. 4–6.* 1941.
Type: *Hodge 54*, from the summit of Morne Trois Pitons, Dominica (GH).
Syn.: *Xiphopteris knowltoniorum* (Hodge) Copel. in Amer. Fern J. **42**: 108. 1952.

Rhizome erect, densely scaly at the apex, the scales linear-oblong to lanceolate, acuminate, 2.5–4.5 mm. long, 0.4–1.4 mm. broad, yellow-brown, not clathrate, the cells turgid. Fronds numerous, closely fasciculate, nearly exstipitate (stipes 1–3 mm. long). Blades linear, 5–14 cm. long, 6–13 mm. broad, attenuate below in the basal third, the lowest segments decurrent into a foliaceous wing; segments oblong to deltate, often gibbous, each segment with 2 hydathodes evident on the upper side marking the tips of the vein forks.

GENERAL DISTRIBUTION: Endemic to the Lesser Antilles.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica.

HABITAT: On mossy trees or shrubs at high elevations; plants rare.

10. **Grammitis taenifolia** (Jenman) Proctor in Bull. Inst. Jamaica Sci. Ser. **5**: 35. 1953.

Basionym: *Polypodium taenifolium* Jenman in Bull. Bot. Dept. Jamaica II, **4**: 114. 1897.
Type: *Syme*, from near Mt. Moses, Jamaica (IJ).
Syn.: *Xiphopteris taenifolia* (Jenman) Copel. in Amer. Fern J. **42**: 109. 1952.

Rhizome somewhat elongate, erect, with scales lance-oblong, 1–2.5 mm. long, light brown, not clathrate, the cells turgid. Fronds stipitate; stipes 5–20 mm. long, densely clothed with long, stiff, spreading reddish hairs. Blades linear, mostly 7–15(–25) cm. long, 4–7 mm. broad, slightly narrowed toward base; segments numerous, oblong, spreading, often slightly gibbous, paler beneath than above, the fertile ones marked on upper side with 2 distinct hydathodes at ends of the vein forks; all parts clothed with numerous stiff, reddish setae.

General Distribution: Greater Antilles except Cuba; Trinidad, northern South America.

Distribution in Lesser Antilles: Saba, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On mossy trees at middle to higher elevations.

Subgenus CRYPTOSORUS

Key to the Species

- a. Sporangia glabrous.
  - b. Blades with margins sinuate or lobed less than halfway to the costa; tissue spongiose .... 11. *G. trifurcata*
  - b. Blades pinnatisect.
    - c. Frond surface and rhizome scales bearing numerous minute whitish stalked glands; tissue spongiose; ultimate veins forked .... 12. *G. curvata*
    - c. Frond surface without glands as above; tissue not spongiose; ultimate veins simple.
      - d. Rhizome filiform, bearing mostly scattered fronds on minute scaly spurs; tissue densely setiferous adjacent to the sori .... 13. *G. anfractuosa*
      - d. Rhizome short, usually erect, the fronds tufted; tissue without setae (except *G. taxifolia*).
        - e. Rhizome scales wholly glabrous (neither ciliate nor hair-pointed); blades normally less than 1.5 cm. broad.
          - f. Sori superficial or but lightly impressed; rhachis wholly glabrous .... 14. *G. phlegmaria*
          - f. Sori deeply impressed (each sorus in a distinct pit in the tissue); rhachis minutely puberulous beneath .... 15. *G. suspensa*
        - e. Rhizome scales with hairs (marginal or apical); blades mostly 2–3.5 cm. broad.
          - g. Hairs of rhizome scales marginal, the scales clathrate; tissue surrounding the sori entirely glabrous .... 16. *G. tenuicula*
          - g. Hairs of rhizome scales apical, the scales not clathrate; tissue surrounding the sori bearing several long, stiff, reddish hairs .... 17. *G. taxifolia*
- a. Sporangia setose; rhizome scales (if present) ciliate.
  - h. Frond surfaces glabrous; sori impressed .... 18. *G. pendula*
  - h. Frond surfaces hairy; sori superficial.
    - i. Rhizome bearing ciliate scales.
      - j. Hairs of the rhachis all simple; frond surfaces very sparsely hairy.
        - k. Segments spreading-decurved, distinctly dilated at base; sori lacking associated long red setae .... 19. *G. asplenifolia*

k. Segments slightly oblique-ascending, not or scarcely dilated at base; each sorus with 1 to several associated long red setae . . . . 20. *G. eggersii*

j. Rhachis with long-branched stellate hairs; frond surfaces densely woolly-hairy . . . . 21. *G. lanigera*

i. Rhizome devoid of scales (clothed with hairs only); fronds laxly pendent, densely soft-pilose . . . . 22. *G. mollissima*

11. **Grammitis trifurcata** (L.) Copel., Gen. Fil. 211. 1947.

Basionym: *Polypodium trifurcatum* L., Sp. Pl. **2**: 1084. 1753.
Type: Plumier, Tr. Foug. *t. 138*, based on an abnormal specimen from Morne de la Calebasse, Martinique. Normally, this species has simple blades which are not trifurcate at the apex.
Syn.: *Polypodium comptoniifolium* Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 316. 1811.

Rhizome short-creeping, 4–6 mm. thick, densely clothed at apex with lance-attenuate, golden-brown scales, these ca. 5 mm. long, with denticulate-ciliolate margins; stipes 5–10 cm. long, clothed with small stiff reddish setae, and deflexed or geniculate at the apex. Blades linear-lanceolate to ligulate, 10–25 cm. long, 1.5–4 cm. broad, blunt or somewhat acute at the apex, with margins sinuate to obliquely lobed from one-third to nearly halfway to the costa, the lobes 6–12 mm. broad, with a few marginal setae; tissue with veins pinnately branched, a few branches casually joined. Sori elliptical, at tips of vein branches, superficial but becoming depressed in the spongiose tissue when dried.

General Distribution: Greater Antilles, continental tropical America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On mossy tree trunks at chiefly higher elevations.

12. **Grammitis curvata** (Sw.) Ching in Bull. Fan Mem. Inst. Biol., Bot. **10**: 240. 1941.

Basionym: *Polypodium curvatum* Sw. in J. Bot. Schrader **1800**(2): 24. 1801.
Type: *Swartz*, from Jamaica.
Syn.: *Polypodium inaequale* Fée, Mém. Fam. Foug. **11**: 47, *t. 12*, *fig. 3*. 1866. (Type from Guadeloupe.)
Ctenopteris curvata (Sw.) Copel. in Philip. J. Sci. **84**: 466. 1955 (1956).

Rhizome somewhat elongate, erect, densely scaly at the apex, the scales ligulate, 2–3 mm. long, bright golden-brown, obtusely denticulate, beset with numerous cylindric, whitish-waxy glands, otherwise glabrous or very sparingly ciliate; stipes very short (less than 1 cm.) or lacking. Blades glabrous, lanceolate to oblanceolate (often irregularly so), mostly 15–45 cm. long, 3.5–7(–9) cm. broad, caudate or abruptly terminated at the apex, long-decurrent at base; segments linear, 3–5 mm. broad, expanded at base, the rhachis winged by the decurrent bases; costae and the forked veins immersed in spongiose tissue, difficult to detect. Sori supramedial. Sporangia immersed in a mass of whitish-waxy glands like those of the frond surface and rhizome scales.

General Distribution: Greater Antilles except Puerto Rico; also a variant in northern South America.

Distribution in Lesser Antilles: Guadeloupe, Dominica.

Habitat: On mossy tree trunks at high elevations; plants very rare.

13. **Grammitis anfractuosa** (Kunze ex Klotzsch) Proctor in Rhodora 63: 35. 1961.

Basionym: *Polypodium anfractuosum* Kunze ex Klotzsch in Linnaea **20:** 375. 1847.
Type: *Moritz 330*, from Merida, Venezuela.
Syn.: *Polypodium induens* Maxon in Bull. Torrey Bot. Club **32:** 75. 1905.
Ctenopteris anfractuosa (Kunze ex Klotzsch) Copel. in Philip. J. Sci. **84:** 431. 1955 (1956).

Rhizome filiform, stoloniferous, giving forth small scaly spurs at wide intervals (2–3 cm.), each spur bearing 1–3 fronds, the rhizome scales deltate-lanceolate to ovate, very small (0.5 mm. long or less), clathrate, glabrous. Fronds stipitate; stipes mostly 5–13 mm. long, narrowly winged or marginate, clothed with small, spreading, reddish-brown setae. Blades narrowly lanceolate, mostly 3.5–7 cm. long, 4–8 mm. broad near or below the middle, slightly narrowed toward both ends; segments deltate-oblong, setose especially along the margins, the ends of veins visible on upper side as small hydathodes. Sori mostly 2 or 3 per segment, becoming subconfluent with age; young mature sporangia with side walls white.

General Distribution: Greater Antilles except Puerto Rico; continental tropical America.

Distribution in Lesser Antilles: Guadeloupe, *Stehlé 1468* (us).

Habitat: On mossy trees at high elevations; plants very rare.

14. **Grammitis phlegmaria** (J. Smith) Proctor in Rhodora **68**: 467. 1966. var. **antillensis** Proctor in Rhodora **68**: 467. 1966.

Type: *Proctor 20307*, from along Trace Victor Hugues near Grande Decouverte, Guadeloupe (ij).
Syn.: *Polypodium flabelliforme* sensu Griseb., Fl. Br. W. Ind. 700. 1864, not Poiret in Lam., 1804.

Rhizome short, clothed at the apex with narrowly deltate, gray-brown, clathrate, glabrous scales 1–3 mm. long. Fronds laxly pendent, of delicate texture, short-stipitate; stipes mostly 2–15 mm. long, narrowly winged or marginate. Blades linear, mostly 5–15 cm. long (exceptionally to 40 cm.), 6–10 mm. broad (exceptionally to 20 mm.), wholly glabrous;

rhachis black; segments oblong, short- to long-decurrent; costae with 2 or 3 simple branches, these not reaching the margins. Sori medial, subconfluent at maturity.

GENERAL DISTRIBUTION: This variety is endemic to the Lesser Antilles; typical *G. phlegmaria* occurs in northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Dominica, Martinique, St. Vincent (reported by Grisebach), Grenada.

HABITAT: On mossy tree trunks at high elevations; plants rare.

15. Grammitis suspensa (L.) Proctor in Brit. Fern Gaz. 9(3): 77. 1962.

Basionym: *Polypodium suspensum* L., Sp. Pl. 2: 1084. 1753.
Type: Plumier, Tr. Foug. *t. 87, right-hand fig.*, based on material from Morne de la Calebasse, Martinique.
Syn.: *Polypodium jubaeforme* Kaulf. in Flora (Regensburg) 6: 364. 1823. (Type from Martinique.)
Polypodium saccatum Fée, Mém. Fam. Foug. 5: 239. 1852. (Syntypes from Guadeloupe and Martinique.)
Ctenopteris jubaeformis (Kaulf.) J. Smith, Hist. Fil. 184. 1875.
Grammitis jubaeformis (Kaulf.) Proctor in Rhodora 63: 35. 1961.

Rhizome slender, erect, with scales numerous, oblong-lanceolate to ovate-cordate, 2–3 mm. long, light brown, entire, clathrate. Fronds recurved-spreading or pendent, nearly exstipitate. Blades linear or narrowly lance-linear, 10–40 cm. long, 6–15(–20) mm. broad, narrowed toward both ends; rhachis black, minutely puberulous; segments numerous, oblique, oblong or deltate-oblong, 4–10 mm. long and 1.5–4 mm. broad at the decurrent base; costae and veins obscure, the veins simple, each ending in a linear hydathode. Sori 2–8 pairs, small, deeply impressed, each growing from a distinct pit in the tissue.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On mossy trees at middle to higher elevations.

16. Grammitis tenuicula (Fée) Proctor in Rhodora 63: 35. 1961.

Basionym: *Polypodium tenuiculum* Fée, Mém. Fam. Foug. 5: 239. 1852.
Type: *L'Herminier*, from Guadeloupe (B, IJ, isotypes).
Syn.: *Polypodium lasiolepis* Mettenius ex Kuhn in Linnaea 36: 130. 1869.
Polypodium grenadense Jenman in Gard. Chron. III, 15: 134. 1894. (Type from Grenada.)
Ctenopteris tenuicula (Fée) Copel. in Philip. J. Sci. 84: 439. 1955 (1956).

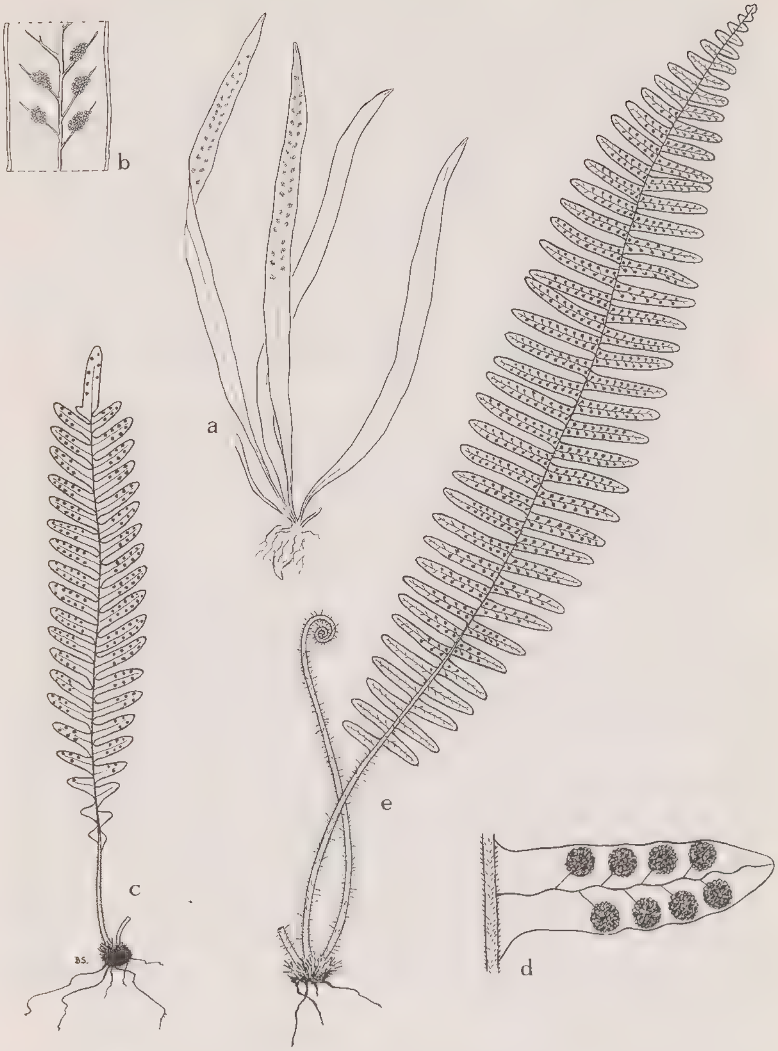

Figure 60b. **Grammitis.** a, b, *G. limbata*: a, habit, × 0.8; b, section of blade showing venation and sori, × 3.2. c, d, *G. tenuicula*: c, habit, × 0.8; d, pinna showing venation and sori, × 5.0. e, *G. taenifolia*, habit, × 0.8.

Rhizome short, erect, with scales narrowly deltate-lanceolate, 1–3 mm. long; stipes relatively short (5–20 mm.), densely puberulous with whitish, spreading hairs. Blades lanceolate, mostly 7–15 cm. long, tapering at both ends, the apex often caudate; rhachis black, puberulous; segments linear-oblong, somewhat oblique, the basiscopic margins slightly decurrent at base; tissue beneath bearing a few, scattered, minute geminate hairs, the veins simple, each ending supramedially in a hydathode. Sori round, usually touching the margins.

General Distribution: Endemic to the Lesser Antilles (typical variety). Two South American varieties have been described, but their relationships are not clear.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Grenada.

Habitat: On mossy trees at middle to higher elevations.

17. **Grammitis taxifolia** (L.) Proctor in Rhodora 63: 35. 1961.

Basionym: *Polypodium taxifolium* L., Sp. Pl. 2: 1086. 1753.
Type: Plumier, Tr. Foug. *t. 89*, based on material from Morne de la Calebasse, Martinique.
Syn.: *Polypodium l'herminieri* Fée, Mém. Fam. Foug. 5: 238. 1852. (Type from Guadeloupe.)
Ctenopteris taxifolia (L.) Copel. in Philip. J. Sci. 84: 447. 1955 (1956).

Rhizome short-creeping or ascending, with scales deltate-lanceolate, 1.5–2.5 mm. long, bright brown, not clathrate (the cells turgid), entire and nonciliate, but the apex prolonged in a long hairlike bristle; stipes 2–5 cm. long, finely and softly rusty-hirtellous. Blades linear to oblanceolate-linear, 10–30 cm. long, 2–3.5 cm. broad near the middle, tapered at both ends; rhachis reddish-setose on both sides; segments linear, at right angles to the rhachis, 1.5–3 mm. broad; costae flexuous, evident, with 6–10 veins on each side, the veins simple, each ending in a medial hydathode usually marked on the upper surface by a minute white calcareous scale. Sori small, round, medial.

General Distribution: Hispaniola, Puerto Rico, Trinidad, northern South America to Brazil.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On mossy trees at middle to higher elevations.

18. **Grammitis pendula** (Sw.) Proctor in Rhodora 63: 35. 1961.

Basionym: *Polypodium pendulum* Sw., Prodr. 131. 1788.
Type: *Swartz*, from Jamaica.
Syn.: *Ctenopteris pendula* (Sw.) J. Smith, Hist. Fil. 185. 1875.

Rhizome short, erect, the scales ligulate, 1–2.5 mm. long, dark gray-brown, clathrate, copiously ciliate. Fronds pendent; stipes very short (less than 1 cm.), setulose. Blades linear-lanceolate, 7–27 cm. long, 0.9–2.1 cm. broad near the middle, narrowed at both ends; rhachis black, sparingly setulose, each minute setula branching from a turgid, glandular base; segments deltate-oblong, rather remote (separated by broad, rounded sinuses), 2.5–3 mm. broad at the middle, expanded and decurrent at base, glabrous, the veins simple, terminating medially in hydathodes. Sori small, round, impressed, usually 4–7 pairs per segment. Sporangia sparsely setulose.

General Distribution: Jamaica; varieties in Cuba and Hispaniola.

Distribution in Lesser Antilles: Guadeloupe, *Proctor 20310* (A, IJ), *Duss 4083*.

Habitat: On mossy trees at high elevations; plants rare.

19. **Grammitis asplenifolia** (L.) Proctor in Brit. Fern Gaz. 9(3): 76. 1962.

Basionym: *Polypodium asplenifolium* L., Sp. Pl. **2**: 1084. 1753, excl. *β*.
Type: Petiver, Pter. Amer. *t. 7*, *fig. 16*, copied from Plumier, Tr. Foug. *t. 102*, *fig. A*, based on material from Morne de la Calebasse, Martinique.
Syn.: *Polypodium suspensum* var. *asplenifolium* (L.) Krug in Engl. Bot. Jahrb. **24**: 127. 1897.
Polypodium suspensum sensu Jenman, Ferns Br. W. Ind. & Guiana 269. 1908, not L., 1753.
Ctenopteris asplenifolia (L.) Copel., Gen. Fil. 219. 1947.
Ctenopteris suspensa sensu Copel. in Philip. J. Sci. **84**: 443. 1955 (1956), not *Polypodium suspensum* L., 1753.

Rhizome short-creeping, densely scaly at the apex, the scales ligulate, 2–4 mm. long, brown, ciliate with numerous reddish-brown setae; stipes 6–15 cm. long, decurved or geniculate at the apex, densely soft-pilose with spreading brownish hairs. Blades drooping or pendent, linear, 15–45 cm. long, 3.5–5 cm. broad, narrowed at the apex and truncate or abruptly narrowed at base, brownish-pilose on rhachis, otherwise hairs chiefly on the margins; segments narrowly deltate-oblong, spreading or slightly decurved, dilate and decurrent at base; the sterile veins simple, the fertile ones with a minute medial spur bearing the sorus. Sori round, superficial. Sporangia abundantly setulose.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On mossy tree trunks in moist forests at chiefly middle elevations.

20. **Grammitis eggersii** (Baker ex Hook.) Proctor in Brit. Fern Gaz. 9(3): 77. 1962.

Basionym: *Polypodium eggersii* Baker ex Hook., Ic. Pl. *t. 1671.* 1886.
Type: *Eggers 937*, from Dominica (K).
Syn.: *Polypodium tenuiculum* var. *husnotii* Fourn. & Mazé ex Duss, Foug. & Lyc. Antill. Franc. 44. 1903. (Syntypes from Guadeloupe and Martinique.)

Rhizome and scales similar to those of *G. asplenifolia*; stipes relatively short, 2–6(–9) cm. long, not decurved at the top, sparingly pilose. Blades erect or spreading, oblanceolate to linear-oblong, 6–25 cm. long, 1.5–3 cm. broad; segments narrowly oblong, oblique, scarcely dilated at base, very slightly or not decurrent, the veins and sori about as in *G. asplenifolia*, except for differences noted in the key, and the sporangia with shorter setulae; spores bright green when fresh.

General Distribution: Endemic to the Lesser Antilles.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On mossy trees at middle to higher elevations.

Jenman (1908) attributed this species to Jamaica, apparently on the basis of a misidentification. It would be possible to consider *Grammitis eggersii* a variety of *G. asplenifolia*, although no intergrades have been seen during the preparation of this book. However, it is certainly not a mere juvenile form of the latter species, as suggested by Copeland (1956).

21. **Grammitis lanigera** (Desvaux) Morton in Contr. U. S. Nat. Herb. 38: 105. 1967.

Basionym: *Polypodium lanigerum* Desvaux in Ges. Naturf. Freunde Berlin Mag. 5: 316. 1811.
Type: *Dombey*, from Peru (P).
Syn.: *Polypodium sericeo-lanatum* Hook., Sp. Fil. 4: 221. 1864.
Polypodium cultratum sensu Duss, Foug. & Lyc. Antill. Franc. 45. 1903, not Willd., 1810.
Ctenopteris lanigera (Desvaux) Copel. in Philip. J. Sci. 84: 420. 1955 (1956).
Ctenopteris sericeo-lanata (Hook.) Copel. in Philip. J. Sci. 84: 453. 1955 (1956).
Grammitis sericeo-lanata (Hook.) Proctor in Rhodora 63: 35. 1961.

Rhizome short-creeping, at apex bearing brown, linear-attenuate, woolly-ciliate scales ca. 2 mm. long. Fronds laxly pendent, short-stipitate; stipes mostly 1.5–4 cm. long, densely whitish-villous. Blades linear, lance-linear, or narrowly oblanceolate-linear, mostly 15–30 cm. long, 3–5 cm. broad (broader in continental forms), densely whitish- or pale brownish-woolly-hirsute throughout; segments oblong or deltate-oblong, somewhat decurrent, rarely auriculate on the acroscopic side. Sori inframedial. Sporangia densely long-hairy, the hairs delicate and flexuous.

General Distribution: Hispaniola, continental tropical America from Costa Rica to Bolivia.

Distribution in Lesser Antilles: Guadeloupe, *Duss 4403* (NY); Martinique, *Duss 1657* (NY).

Habitat: On mossy tree trunks at higher elevations; plants very rare.

22. **Grammitis mollissima** (Fée) Proctor in Rhodora **63**: 35. 1961.

Basionym: *Polypodium mollissimum* Fée, Mém. Fam. Foug. **11**: 47, *t. 12, fig. 2.* 1866.
Type: *L'Herminier in 1861*, from Guadeloupe.
Syn.: *Polypodium suspensum* var. *mollissimum* (Fée) Krug in Engl. Bot. Jahrb. **24**: 127. 1897.
Ctenopteris mollissima (Fée) Copel. in Philip. J. Sci. **84**: 423. 1955 (1956).

Rhizome small, erect, densely rusty-pilose. Fronds laxly pendent; stipes blackish, very short (0.5–2 cm.), densely pilose at base, the hairs pale rusty, spreading. Blades linear, mostly 10–30(–45) cm. long, 0.7–2.5 cm. broad, narrowed at base, densely hirtellous throughout and minutely glandular, especially beneath; segments mostly ovate-oblong, roundish at the apex, somewhat dilated and decurrent at base. Sori 1–4 pairs per segment, terminal on simple veins, chiefly borne near the apex of segments. Sporangia whitish-setulose.

General Distribution: Greater Antilles, Central America.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Vincent.

Habitat: On shaded tree trunks at chiefly middle elevations.

Doubtful Records

Polypodium crispatum L., Sp. Pl. 2: 1084. 1753, was based on Petiver, Pter. Amer. *t. 13, fig. 12*, which was in turn copied from Plumier, Tr. Foug. *t. 102, fig. B*, based on a plant found at Morne de la Calebasse, Martinique. This does not resemble any species known today. Recent collecting at the type locality failed to disclose any plant that could have inspired a drawing like Plumier's.

Grammitis graminea (Sw.) Ching in Bull. Fan Mem. Inst. Biol., Bot. 10: 240. 1941, was apparently recorded (as *G. linearis*) from St. Vincent by Grisebach (1864) and Fée (1866) on the basis of a Guilding specimen not seen by the present writer. This species is now considered to be endemic to Jamaica; the Guilding plant may perhaps have been an unbranched form of *Grammitis furcata* Hook. & Grev., a species known to occur in Grenada but not otherwise in the Lesser Antilles.

COCHLIDIUM Kaulfuss

Cochlidium Kaulf. in Berlin Jahrb. Pharm. 21: 36. 1820. FIGURE 61.

Very small epiphytic ferns. Rhizomes relatively stout and tough, bearing scales at the apex. Fronds closely fasciculate, obscurely articulate to the rhizome, linear, simple or furcate, flat or the fertile portion concave beneath, of papery or rather stiff texture; costa often concealed, the veins free, or sometimes lacking toward the apex of the blade. Sori linear, without indusium, consisting of a row of sporangia borne along the costa on either side, this double line soon becoming confluent and appearing as a single line, this superficial or immersed in a groove. Sporangia with annulus of 10 cells.

TYPE SPECIES: *Cochlidium graminoides* (Sw.) Kaulf., based on *Grammitis graminoides* Sw. of Jamaica. — [illegible]

A small tropical American genus of about six or seven species, probably derived from *Grammitis*. Two species occur in the Lesser Antilles.

SPECIAL LITERATURE: Christensen, Taxonomic Fern Studies — I. Revision of the polypodioid genera with longitudinal coenosori (Cochlidiinae and "Drymoglossinae"), with a discussion of their phylogeny, in Dansk. Bot. Ark. 6(3): 16–34. 1929.

KEY TO THE SPECIES

a. Sori superficial, not immersed in a groove; blades 2–5 mm. broad, flat on both sides with raised costa .... 1. *C. seminudum*

a. Sori immersed in a deep groove, the edges of which are extended and conceal the young sporangia; blades not over 2.5 mm. broad, the costa prominent on upper side and flat beneath, so that the blade appears triangular in cross-section .... 2. *C. linearifolium*

1. **Cochlidium seminudum** (Willd.) Maxon in Sci. Surv. Porto Rico & Virgin Is. 6: 407. 1926.

Basionym: *Blechnum seminudum* Willd., Phytogr. 13, *t. 8, fig. 2.* 1794.
Type: *Isert in 1787, Herb. Willd. 19587*, from Martinique (B).
Syn.: *Taenitis linearis* Kaulf., Enum. Fil. 131. 1824. (Type from Guadeloupe.)
Taenitis pumila Kaulf., Enum. Fil. 132. 1824. (Based on *Blechnum seminudum* Willd.)
Taenitis graminifolia Hook., Exot. Fl. 1: *t. 77.* 1825, excl. ref. Sw. (Type from St. Vincent.)
Micropteris blechnoides Desvaux in Mém. Soc. Linn. Paris 6: 217. 1827. (Based on *Blechnum seminudum* Willd.)
Pleurogramme linearis (Kaulf.) C. Presl, Tent. Pter. 223, *t. 10, fig. 2.* 1836.
Pleurogramme pumila (Kaulf.) C. Presl, Tent. Pter. 223. 1836.
Pleurogramme graminifolia (Hook.) C. Presl, Tent. Pter. 223. 1836.
Monogramme graminifolia (Hook.) Hook., Sp. Fil. 5: 125. 1864.

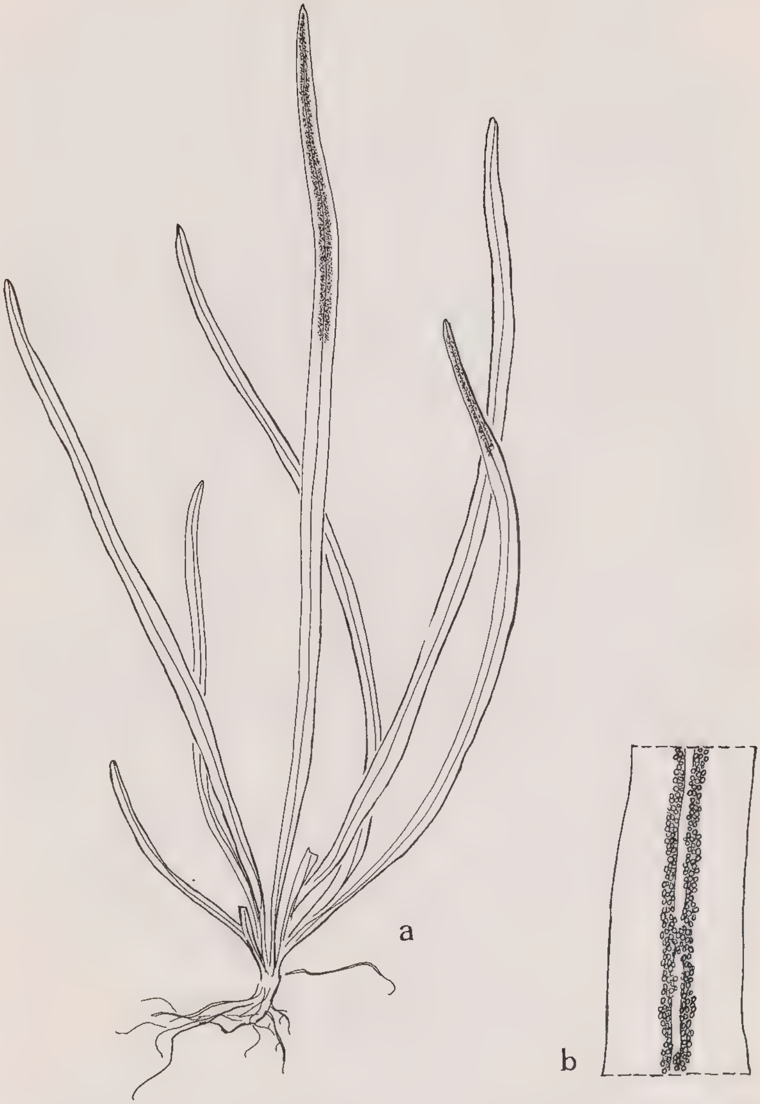

FIGURE 61. **Cochlidium.** a, b, *C. seminudum*: a, habit, × 1.5; b, section of blade showing rows of sporangia borne along either side of the costa, × 4.8.

Monogramme seminuda (Willd.) Baker in Hook. & Baker, Syn. Fil. 375. 1868.
Pleurogramme seminuda (Willd.) J. Smith, Hist. Fil. 178. 1875.
Pleurogramme nuda Goebel in Flora (Regensburg) **117:** 119, *figs.* 1924.

Rhizome ascending or erect, 1–3 cm. long, 3–6 mm. thick, with scales yellowish-brown, lance-attenuate, entire. Fronds numerous, nearly stipeless, 8–20 cm. long and 2–5 mm. broad, linear with attenuate, obtuse apex, often subfalcate or recurved, the numerous veins close, oblique, simple, with clavate tips not reaching the margins.

GENERAL DISTRIBUTION: Greater Antilles except Cuba; Trinidad, northern South America.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On mossy tree trunks and branches at middle to higher elevations; plants frequent.

2. **Cochlidium linearifolium** (Desvaux) Maxon ex C. Chr. in Dansk. Bot. Ark. 6(3): 23. 1929.

Basionym: *Monogramm~~e~~a linearifolia* Desvaux in Ges. Naturf. Freunde Berlin Mag. **5**: 302, *t. 7*, *fig. 5*. 1811.
Type: Collector not stated, ex *Herb. Desvaux*, from French Guiana (P).
Syn.: *Pleurogramme immersa* Fée, Mém. Fam. Foug. 3: ~~8~~37, *t. 4*, *fig. 5*. 1852.
Monogramma immersa (Fée) Hook. (1864)

Rhizome and scales similar to those of *C. seminudum.* Fronds few, very stiff in texture, nearly stipeless, 7–15 cm. long, acute at the apex, the veins immersed, simple or occasionally forked, ending in distinct hydathodes not reaching the margins. Sori often confined to the middle portion of the frond.

GENERAL DISTRIBUTION: Greater Antilles except Puerto Rico; northern South America.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, *L'Herminier* (P), *Mazé 858* (K).

HABITAT: On mossy trees at higher elevations; plants very rare.

Subfamily VITTARIOIDEAE

KEY TO THE SPECIES

a. Fronds dichotomously cleft or furcate at the apex; veins all free .... 48. *Hecistopteris*
a. Fronds simple, not cleft at apex; veins reticulate.
  b. Sporangia minute, superficial, deciduous, growing in small irregular clusters both along veins and on nonvascular tissue .... 49. *Anetium*
  b. Sporangia in definite elongate sori, always along veins.

c. Sori dorsal and more or less reticulate in pattern; paraphyses absent .... 50. *Polytaenium*

c. Sori submarginal, forming a single line on either side; paraphyses present.

  d. Veins forming 1 row of areoles on either side of the costa .... 51. *Vittaria*

  d. Veins forming several rows of areoles on either side of the costa .... 52. *Ananthacorus*

HECISTOPTERIS John Smith

Hecistopteris J. Smith in London J. Bot. 1: 193. 1842. FIGURE 62.

A minute epiphyte (rarely on wet rocks), with filiform, creeping rhizomes bearing scales and fronds in distinct tufts, the scales delicate, attenuate, clathrate, highly iridescent. Fronds nearly stipeless, cuneiform, dichotomously cleft or dissected, with venation flabellate and no costa evident. Sori linear, on the ultimate and penultimate vein branches, superficial, with numerous filiform paraphyses. Sporangia with annulus of 14–22 cells.

TYPE SPECIES: *Hecistopteris pumila* (Sprengel) J. Smith, based on *Gymnogramma pumila* Sprengel of tropical America.

1. **Hecistopteris pumila** (Sprengel) J. Smith in London J. Bot. 1: 193. 1842.

Basionym: *Gymnogramma pumila* Sprengel, Tent. Suppl. Syst. Veg. 31. 1828. Type: *Weigelt*, from Surinam (B).

Characters of the genus; fronds thin-herbaceous, 1–2 cm. long, 0.2–1 cm. broad toward the expanded apex. Sori becoming confluent laterally with age.

GENERAL DISTRIBUTION: Greater Antilles, Trinidad, continental tropical America from Mexico to Brazil.

DISTRIBUTION IN LESSER ANTILLES: Guadeloupe, Martinique.

HABITAT: On mossy tree trunks (especially palms) in moist forests at lower to middle elevations; plants very rare.

ANETIUM Splitgerber

Aneitum Splitg. in Tijdschr. Nat. Gesch. 7: 395. 1840. FIGURE 62.

Syn.: *Pteridanetium* Copel., Gen. Fil. 224. 1947.

A lax, fleshy epiphyte (rarely on wet rocks) of deeply shaded habitats in moist forest. Rhizomes slender, wide-creeping, more or less embedded in a mass of feltlike hairy roots, and densely clothed at the apex with delicate clathrate scales. Fronds distant, pendent, nearly or quite stipeless; tissue on the upper (adaxial) side marked with numerous minute

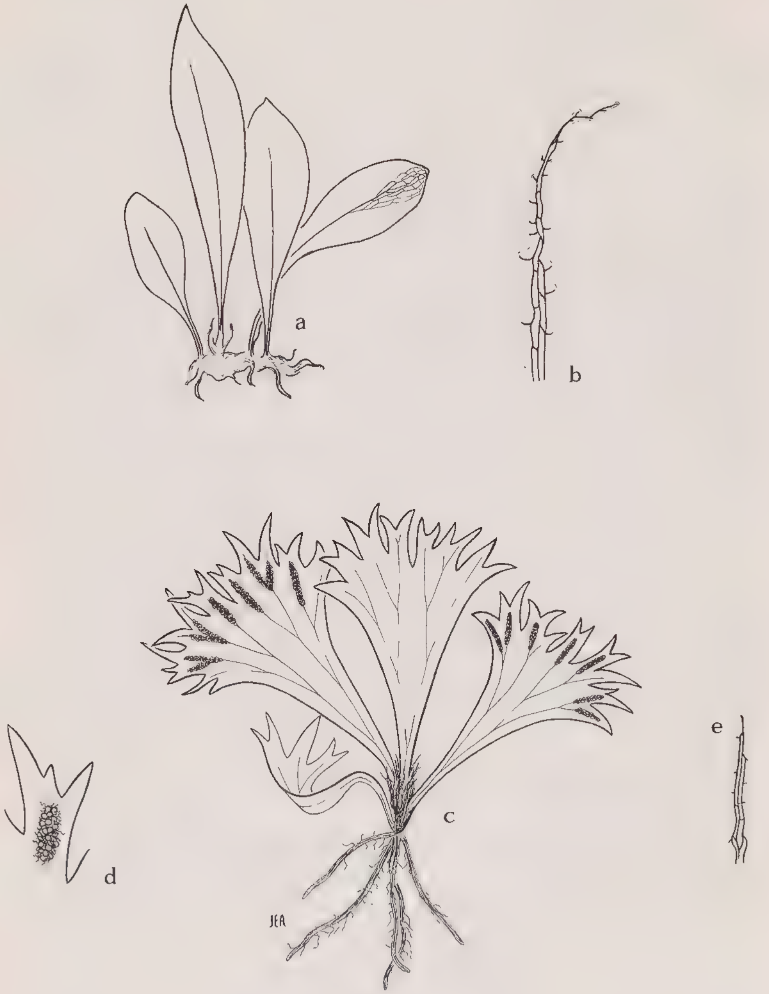

FIGURE 62. **Anetium and Hecistopteris.** a, b, *A. citrifolium*: a, habit, × 0.3; b, clathrate scale, from apex of rhizome, × 24.0. c–e, *H. pumila*: c, habit, × 3.2; d, segment of frond showing sori and filiform paraphyses, × 6.4; e, clathrate scale, from rhizome, × 13.0.

linear cystoliths; costa not reaching apex of blade, the veins reticulate, forming numerous elongate-hexagonal areoles. Sporangia with annulus of 10–12 cells; spores globose-tetrahedral, smooth, hyaline.

TYPE SPECIES: *Anetium citrifolium* (L.) Splitg., based on *Acrostichum citrifolium* L. of tropical America.

1. **Anetium citrifolium** (L.) Splitg. in Tijdschr. Nat. Gesch. 7: 395. 1840.

Basionym: *Acrostichum citrifolium* L., Sp. Pl. 2: 1067. 1753.
Type: Plumier, Tr. Foug. *t. 116*, based on material from Cabsterre, Parish of Ste. Marie, Martinique.
Syn.: *Antrophyum citrifolium* (L.) Fée, Mém. Fam. Foug. 4: 51. 1851.

Characters of the genus; rhizome scales lance-attenuate, highly iridescent. Fronds elliptic-oblong to oblanceolate, variable, 10–40 cm. long, 2.5–7 cm. broad.

GENERAL DISTRIBUTION: Greater Antilles except Cuba; Tobago, Trinidad, continental tropical America from Guatemala to Brazil.

DISTRIBUTION IN LESSER ANTILLES: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: Mossy tree trunks and boulders at lower to middle elevations.

POLYTAENIUM Desvaux

Polytaenium Desvaux in Mém. Soc. Linn. Paris 6: 218. 1827.

FIGURE 63.

Small epiphytes (or rarely on moist rocks) of rain forest areas. Rhizomes short-creeping, often clustered among dense masses of feltlike roots. Fronds closely distichous, elongate, without stipes, costate to the apex, the veins reticulate, forming uniform areoles, these longitudinal or oblique. Sori in lines on some or all of the veins, superficial or immersed in furrows, elongate-linear and disconnected to reticulate. Spores tetrahedral-globose.

TYPE SPECIES: *Polytaenium lineatum* (Sw.) J. Smith, based on *Hemionitis lineata* Sw., of the Greater Antilles and continental tropical America.

A small genus of perhaps 10 tropical American species, two of these occurring in the Lesser Antilles. This taxon differs from the mostly Old World genus *Antrophyum* in having fronds costate to the apex, and in the absence of paraphyses. Some authors do not consider these criteria to have sufficient weight to justify generic separation.

KEY TO THE SPECIES

a. Fronds linear to linear-lanceolate, mostly 1–1.5 cm. broad near the middle (rarely broader); axes of the areoles parallel to the costa . . . . 1. *P. feei*

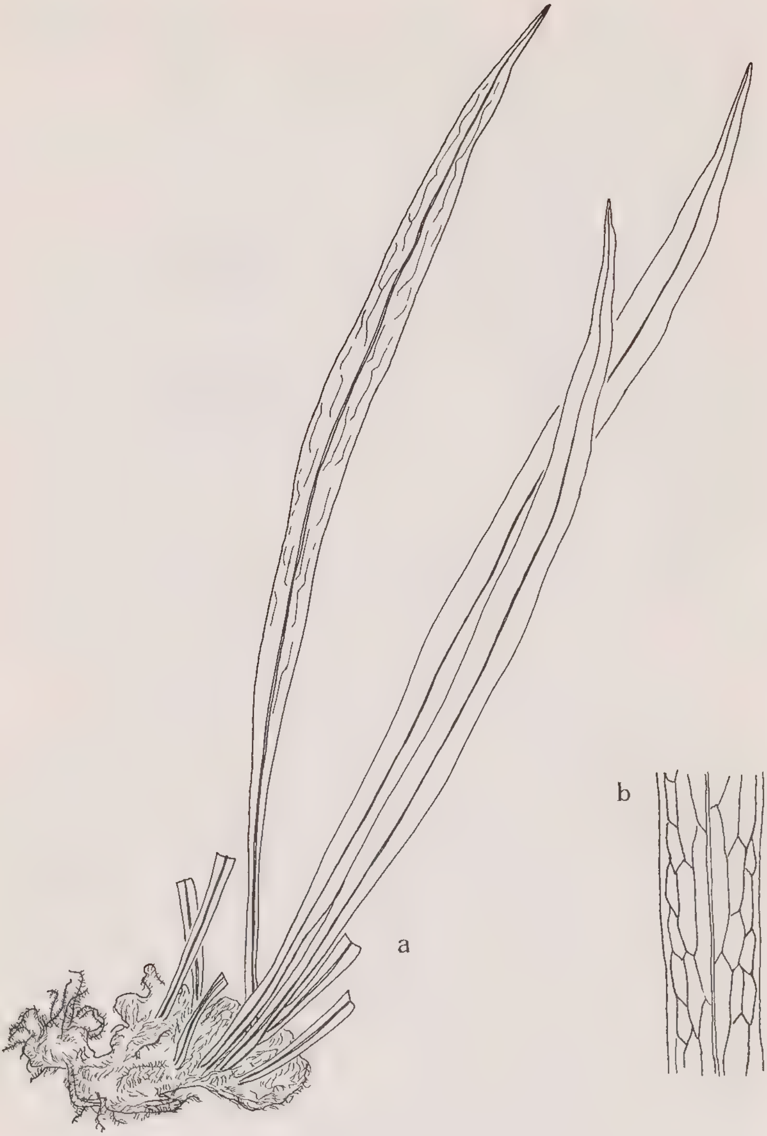

FIGURE 63. **Polytaenium.** a, b, *P. feei*: a, habit, × 0.7; b, section of blade showing venation, × 1.3.

a. Fronds narrowly oblong to oblanceolate, 2–4 cm. broad above the middle; axes of the areoles divergent from the costa .... 2. *P. dussianum*

- Polyt. lanceolatum (L.) Benedict (1911)

1. **Polytaenium ~~feei~~** (Schaffner) Maxon in Sci. Surv. Porto Rico & Virgin Is. 6: 405. 1926.

Basionym: *Antrophyum feei* Schaffner ex Fée, Mém. Fam. Foug. 7: 42, *t. 22, fig. 1.* 1857.
Type: *Schaffner 133*, from Huatusco, Vera Cruz, Mexico.
Syn.: *Hemionitis lanceolata* L., Sp. Pl. 2: 1077. 1753.
Antrophyum lanceolatum (L.) Kaulf., Enum. Fil. 198. 1824.
Dictyogramme lanceolata (L.) Trev. in Atti Ist. Veneto V, 3: 592. 1877.
Polytaenium lanceolatum (L.) Benedict in Bull. Torrey Bot. Club 38: 169. 1911, not Desvaux, 1827.

Rhizomes rather short, in dense masses, with lance-attenuate, somewhat iridescent, denticulate-margined scales. Fronds numerous, clustered, 20–55 cm. long, attenuate at both ends, flaccid and rather fleshy. Sori nearly superficial, in flexuous branched lines, these never wholly reticulate.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to northern South America.

Distribution in Lesser Antilles: St. Kitts, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

Habitat: On tree trunks and boulders in moist sheltered forested ravines at chiefly middle elevations.

2. **Polytaenium dussianum** (Benedict) Benedict in Bull. Torrey Bot. Club 38: 169. 1911.

Basionym: *Antrophyum dussianum* Benedict in Bull Torrey Bot. Club 34: 453. 1907.
Type: *Duss 4226*, from Guadeloupe (NY).

Rhizomes short, in dense masses, with very long-attenuate, iridescent, denticulate-margined scales. Fronds several, clustered, 20–40 cm. long, attenuate below, rather abruptly acute or blunt at the apex, somewhat fleshy, the veins areoles nearest the margins producing some free veinlets toward the margins. Sori partly immersed in shallow grooves, in flexuous, casually joined lines.

General Distribution: Cuba, Hispaniola, Trinidad.

Distribution in Lesser Antilles: St. Kitts, Guadeloupe, Dominica, Martinique, St. Lucia.

Habitat: On shaded rocks and tree trunks in moist forests at chiefly middle elevations.

VITTARIA Smith

Vittaria Smith in Mém. Acad. Turin **5**: 413, *t. 9*. 1793. FIGURE 64.

Small to medium-sized epiphytes with erect or short-creeping, often densely clustered rhizomes, these usually immersed in a mass of feltlike roots and bearing clathrate scales at the apex. Fronds crowded, erect or pendent, narrowly to somewhat broadly linear, costate to the apex, with veins forming a single row of areoles between the costa and the inframarginal fertile vein, superficial or immersed in a furrow. Sporangia with annulus of 14–18(–20) cells; spores smooth.

TYPE SPECIES: *Vittaria lineata* (L.) Smith, based on *Pteris lineata* L. of the American tropics and subtropics.

A pantropical genus of between 50 and 75 species, some not clearly defined. Two species occur in the Lesser Antilles. Some species are occasionally called "shoestring ferns" or "grass ferns."

KEY TO THE SPECIES

a. Rhizome scales dark brown, with long hairlike tips, these unicostate; spores diplanate .... 1. *V. lineata*

a. Rhizome scales yellowish- or chestnut-brown, the tips attenuate but not hairlike, pluricostate nearly to the end; spores globose .. 2. *V. graminifolia*

1. **Vittaria lineata** (L.) Smith in Mém. Acad. Turin **5**: 413, *t. 9, fig. 5*. 1793.

Basionym: *Pteris lineata* L., Sp. Pl. 2: 1073. 1753.
Lectotype: Plumier, Descr. Pl. Amer. *t. 41* (= Tr. Foug. *t. 143*), based on material from "la source de la Riviere froide," near Port de Paix, Haiti.

Rhizome short-creeping, conspicuously scaly, the scales iridescent. Fronds numerous, densely clustered, usually pendent, mostly 30–130 cm. long, 2–3 mm. broad, broadly sulcate on the upper side, the margins thick and rounded, the lateral veins short, distant, the areoles thus longitudinal-linear. Sori sunk in deep grooves overlying the inframarginal vein on either side of the costa; paraphyses branched, cylindric, the end cells enlarged, curved, brown.

GENERAL DISTRIBUTION: Southeastern United States, Bahamas, Greater Antilles, Tobago, Trinidad, continental tropical America from Mexico to Paraguay.

DISTRIBUTION IN LESSER ANTILLES: Antigua, St. Eustatius, St. Kitts, Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent, Grenada.

HABITAT: On tree trunks or mossy logs at lower to middle elevations.

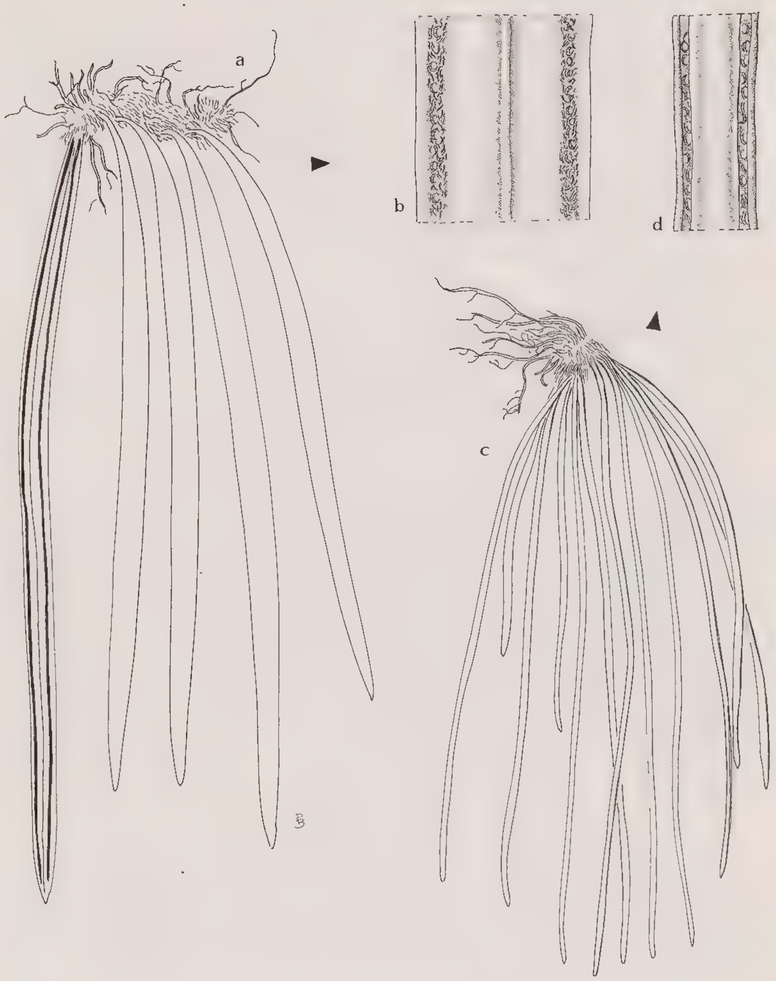

FIGURE 64. **Ananthacorus and Vittaria.** a, b, *A. angustifolius*: a, habit, × 0.3; b, section of blade showing inframarginal line of sori, × 2.5. c, d, *V. lineata*: c, habit, × 0.3; d, section of blade showing sori sunk in deep grooves overlying the inframarginal vein on either side of the costa, × 5.0.

2. **Vittaria graminifolia** Kaulf., Enum. Fil. 192. 1824.

Type: *Otto*, from Brazil.
Syn.: *Vittaria filifolia* Fée, Mém. Fam. Foug. 3: 20, *t. 3, fig. 6.* 1851. (Type from Mexico.)
Vittaria lineata f. *filifolia* (Fée) Duss, Foug. & Lyc. Antill. Franc. 90. 1903.

Rhizome short-creeping, or sometimes ascending and tufted, the scales slightly iridescent. Fronds few or numerous, closely clustered, arching or pendent, mostly 10–40 cm. long, 1–3 mm. broad, moderately or not sulcate on the upper surface, the veins and sori similar to those of *V. lineata*.

General Distribution: Greater Antilles, continental tropical America from Mexico to Brazil.

Distribution in Lesser Antilles: Montserrat, Guadeloupe, Dominica, Grenada (reported by Domin).

Habitat: On mossy earth banks, rocks, logs, and tree trunks at middle to higher elevations; plants not common.

ANANTHACORUS Underwood & Maxon

Ananthacorus L. M. Underw. & Maxon in Contr. U. S. Nat. Herb. 10: 487. 1908. Figure 64.

Small pendent epiphytes. Rhizomes short-creeping, embedded in masses of feltlike roots and bearing clathrate scales at the apex. Fronds numerous, narrowly linear, without stipes. Blades costate to the apex, the costa concealed by the opaque tissue, the venation wholly reticulate, with several rows of areoles on either side of the costa, these narrowly elongate, hexagonal or pentagonal. Sori nearly superficial, linear, forming a continuous or subcontinuous inframarginal line at the outer border of the outermost row of areoles; paraphyses clavate. Sporangia with annulus of about 16 cells; spores diplanate, smooth.

Type species: *Ananthacorus angustifolius* (Sw.) L. M. Underw. & Maxon, based on *Pteris angustifolia* Sw. of tropical America.

This genus, based solely on a difference in venation, is very weakly differentiated from *Vittaria* and is accepted here with reluctance.

1. **Ananthacorus angustifolius** (Sw.) L. M. Underw. & Maxon in Contr. U. S. Nat. Herb. 10: 487. 1908.

Basionym: *Pteris angustifolia* Sw., Prodr. 129. 1788.
Type: *Swartz*, from the West Indies without definite locality, probably Jamaica.
Syn.: *Taenitis angustifolia* (Sw.) Sprengel in L., Syst. Veg. 4: 42. 1827.
Pteropsis angustifolia (Sw.) Desvaux in Mém. Soc. Linn. Paris 6: 218. 1827.
Vittaria angustifolia (Sw.) Baker non Blume (1828) in Mart., Fl. Bras. 1(2): 544. 1870.

Characters of the genus; rhizome scales linear-filiform, reddish-brown, iridescent. Fronds mostly 15–55 cm. long, 8–18 mm. broad, narrowed at both ends, the venation concealed in the opaque tissue. Sori 1–2 mm. broad, dark brown.

General Distribution: Greater Antilles, Trinidad, continental tropical America from Mexico to Bolivia and Brazil.

Distribution in Lesser Antilles: Guadeloupe, Dominica, Martinique, St. Vincent, Grenada.

Habitat: On trunks of forest trees, especially near streams, at chiefly middle elevations.

Order MARSILEALES

Family MARSILEACEAE

Aquatic or semiaquatic herbs with elongate, branched, hairy rhizomes. Fronds circinate in bud, linear-filiform, or else long-petiolate and 2- or 4-foliolate, the segments with flabellate venation. Fertile plants bearing 1 to several sessile or stalked, capsulelike sporocarps at the base of the stipes or along their lower part. Sporocarps variously septate within, the sori solitary within the compartments, each sorus with two kinds of sporangia; megasporangia each containing a single large megaspore, this coated with mucilage; microsporangia containing numerous minute microspores. Gametophytes few-celled, minute, developing chiefly within the spores.

A small family of three genera and about 55 species. One genus, represented by a single species, occurs in the Lesser Antilles, but it is very rare.

MARSILEA Linnaeus

Marsilea L., Sp. Pl. 2: 1099. 1753. Figure 65.

Plants of shallow ponds, ditches, marshy shores, and seasonal rainpools. Fronds 4-foliolate (cloverlike), the entire blade more or less orbicular in expanded outline, the segments cuneate, sessile. Sporocarps subglobose to oblong-ovoid, at maturity splitting into 2 valves, each valve emitting a band of mucilaginous tissue which bears the sori at intervals within membranous envelopes.

Type species: *Marsilea quadrifolia* L. of southern Europe, Asia, and Japan; naturalized in North America.

A cosmopolitan genus of about 45 species.

The following treatment of the single Lesser Antillean species has been contributed by Dr. E. Launert of the British Museum (Natural History).

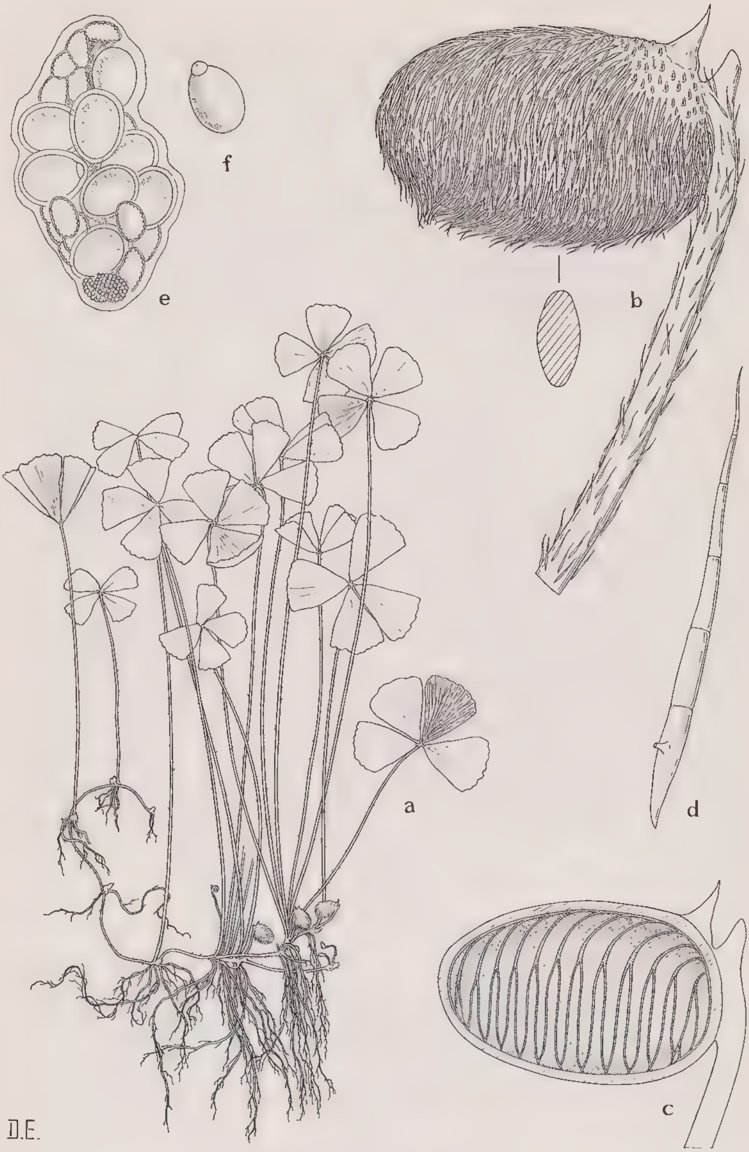

FIGURE 65. **Marsilea.** a–f, *M. vestita*: a, habit, × 0.6; b, sporocarp with two teeth, the surface appressed-pilose, × 1.2; c, sporocarp split to show internal pattern of venation, × 7.0; d, multicellular hair from peduncle, × 2.4; e, sori within membranous envelope, with two kinds of sporangia, the smaller microsporangia containing minute microspores, the larger megasporangia with megaspores, × 7.0; f, megasporangium, × 7.0.

1. **Marsilea vestita** Hook. & Grev., Ic. Fil. 2: *t. 159*. 1831; A. Braun in Monatsb. Königl. Akad. Wiss. Berlin **1870**: 741. 1871.

Type: *Scouler, Herb. Hooker*, from the Columbia River, Oregon, U.S.A. (K).
Syn.: *Marsilea uncinata* A. Braun in Flora (Regensburg) 22: 300. 1839.
Marsilea mucronata A. Braun in Sillim. Amer. J. Sci. II, 3: 55. 1847.

Fronds 5–12 cm. long, with slender, glabrate stipes; segments broadly obovate-cuneate or rounded-obdeltate, 0.5–2 cm. broad at the broadly rounded apex, at first thinly appressed-hairy, soon becoming glabrate. Sporocarps solitary, appressed-pilose at first, later often glabrate, 5–7 mm. long, 4–5.25 mm. wide, elliptic-oblong to broadly elliptic in lateral view, narrowly oblong to elliptic in dorsoventral cross-section, 1–2.7 mm. thick; two teeth present, separated by a wide sinus, the superior tooth usually acute and often slightly curved, the inferior blunt and sometimes slightly recurved. Peduncle 3–6.5(–15) mm. long, arising from the rhizome at bases of stipes.

GENERAL DISTRIBUTION: North America from southern Canada to northern Mexico; also reported from the Bahamas (Acklins Island, by Correll in Amer. Fern J. 64: 97. 1974). Reports from South Caicos probably pertain to *M. nashii.*

DISTRIBUTION IN LESSER ANTILLES: Barbuda, Horse Pond, *Box 594a* (BM, IJ, US), collected May 16, 1937.

HABITAT: In mud from seasonal rainpools, near sea level.

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GLOSSARY

The study and description of plants requires many specialized words to describe unique structures or conditions. Other botanical words are ordinary ones but with special meanings not usually given in nontechnical dictionaries. For these reasons, a glossary is here presented, chiefly to aid the nonprofessional user of this book, who might otherwise find the technical terminology an obstacle rather than an aid to precise definition, thereby hindering the study and identification of the plants described.

Many of the definitions used here have been taken or adapted from the glossary in D. S. Correll's *Ferns and fern allies of Texas* (1956). Others were obtained from B. D. Jackson's *A glossary of botanic terms* (1905). A few have been obtained from miscellaneous other sources.

Abaxial — turned away from an axis; used to designate the underside of a fern frond, the side on which sporangia are borne.

Abortive — structures with arrested, incomplete, or distorted development.

Abscission — the breaking away of leaves or other structures through formation and rupture of a special weak-walled layer of cells at the point of attachment.

Acicular — needle-shaped.

Acroscopic — facing or directed toward apex (e.g., of a fern frond).

Acuminate — tapering to a point.

Acute — pointed, but not tapering.

Adaxial — turned toward an axis; the upper (nonsporangiate) side of a fern frond.

Adnate — having one structure attached wholly or in part to another.

Adpressed — closely applied to a surface; lying flat against a surface.

Adventitious — as applied to roots, arising from some part of a plant other than the base of a stem.

Aerophore — an epidermal projection occurring in the axils of pinnae in some ferns, called thus because it was once thought to have some aerating function.

Anadromous — a fern frond in which the first secondary division of all the pinnae is always on the acroscopic side; also applied to venation patterns in which the first set of nerves in each segment is given off on the acroscopic side.

Anastomosing — pertaining to leaf veins that repeatedly unite to form network; reticulate.

Angulate — bearing corners or sharp angles.

Annual — a plant whose normal life span is one year or one growing season.

Annulus — the elastic ring of thickened cells partly or completely surrounding the apex of a sporangium in the Filicales.

Antheridium — the male reproductive organ in pteridophytes.

Antherozoid — a motile gamete produced in an antheridium; also called spermatozoid.

Antrorse — directed forward and upward.

Apex (pl. **apices**) — the tip of an organ or structure.

Apical — pertaining to the tip of any structure.

Appressed — lying flat against another structure; adpressed.

Approximate — close together but not united.

Arachnoid — cobwebby from an entanglement of fine, soft hairs.

Arborescent — treelike.

Archegone — an egg cell produced in an archegonium.

Archegonium — the female reproductive organ in pteridophytes.

Arcuate — curved like an arch.

Areole — the area enclosed by anastomosing veins.

Aristate — tipped with a stiff, bristlelike hair.

Articulate — jointed; separating by abscission.

Ascending — rising obliquely or curving upward; slanted.

Assurgent — abruptly ascending.

Asymmetric or **asymmetrical** — having two unlike sides.

Attenuate — narrowly tapering; drawn out to a long, slender point.

Auricle — an ear-shaped appendage.

Auriculate — having a basal lobe; bearing auricles.

Axil — the angle formed by a leaf, leaflet, or pinna with a stem or rhachis, or any similar location between two other structures.

Axillary — growing or produced in an axil.

Basiscopic — facing or directed toward the base (e.g., of a fern frond).

Bicolorous — a structure marked in two colors or shades.

Bifid — forked, with two branches.

Blade — the expanded, leafy portion of a frond; also called the lamina.

Bullate — a leaf surface (or similar structure) that is inflated, puckered, or appearing broadly blistered.

Caducous — soon dropping off.

Caespitose — growing in tufts or clumps.

Calcareous — limy; containing an excess of available calcium, usually in the form of lime (calcium carbonate); a term applied to limestone rocks or soil derived from limestone.

Capillary (adj.) — hairlike.

Capitate — shaped like a head; having a round, enlarged apex; growing in a dense, round cluster.

Carinate — having a keel.

Cartilaginous — tough like cartilage (also often somewhat translucent).

Castaneous — chestnut-colored, reddish-brown.

Catadromous — a fern frond in which the first secondary division of the median pinnae is on the basiscopic side; also applied to venation patterns in which the first set of nerves in each segment is given off on the basiscopic side.

Caudate — having a slender taillike apex or appendage.

Caudex — rhizome; especially the trunk of a tree fern.

Ceraceous — waxy.

Chaff — a mass of thin, dry scales.

Chartaceous — of papery texture.

Ciliate — having a marginal fringe of hairs.

Ciliolate — minutely ciliate.

Circinnate — coiled; rolled up on the axis with the apex as a center.

Clathrate — latticelike; in ferns applied especially to scales with opaque contiguous cell walls but whose upper and lower surfaces are more or less transparent and often iridescent.

Clavate — club-shaped.

Clone — a homogeneous population descended from a single individual by nonsexual means of reproduction.

cm. — centimeter, a measure of length equal to 0.3937 inches (2.54 cm. = 1 inch).

Coenosorus — a compound sorus, made up of several contiguous or merged sori.

Compound — composed of or having two or more similar parts; a leaf or frond subdivided into several or many leaflets or pinnae.

Concave — hollowed out; curved inward; excavate (adj.); the opposite of convex.

Concolorous — of one uniform color.

Cone — a compact cluster of sporophylls, often conical, ovoid, or ellipsoid in shape; also called a strobilus or strobile.

Connivent — converging; coming together but not joined.

Convex — rounded or bulging; curved outward; the opposite of concave.

Cordate — heart-shaped; applied especially to the base of leaf blades or similar flat structures when the two sides are convexly incurved to the point of attachment.

Coriaceous — of leathery texture.

Costa (pl. **costae**) — a midrib (i.e. of a leaf); in ferns applied to the vascular axis of blade in simple fronds, or else to the axis of a primary pinna.

Costate — having a midrib.

Costule — the axis or midvein of a pinnule.

Crenate — a margin with rounded teeth.

Crenulate — finely crenate.

Crispate — irregularly curled or crinkled.

Cuneate — wedge-shaped; triangular with the acute angle downward (as applied especially to the bases of leaf blades).

Cuspidate — tipped with a sharp point.

Cylindric — elongate, with a circular cross-section.

Deciduous — falling away at the end of a growing season.

Decompound — several times compound or subdivided.

Decrescent — diminishing gradually in size.

Decumbent — reclining (horizontal) but with the growing end ascending or erect.

Decurrent — extending down a stem or rhachis below the point of attachment.

Decurved — bent downward.

Deflexed — turned abruptly downward.

Dehiscent — splitting by valves, slits, or pores.

Deltate — triangular; term used in preference to "deltoid" for flat structures.

Dentate — toothed, usually with the teeth directed outward.

Denticulate — minutely dentate.

Determinate — growing to a predetermined length, after which apical elongation ceases; the opposite of "indeterminate."

Dichotomous — forking regularly, the two more or less equal branches forked again, and so on; in such a structure there is no main axis.

Dictyostelic — pertaining to a type of stele in which the vascular tissue is arranged in cylindrically placed separate bundles.

Dimidiate — one-sided; applied to leafy structures with asymmetric venation, the primary vein (costa or costule) being located along or near one side.

Dimorphic — occurring in two forms.

Dioecious — having male and female reproductive organs on separate plants; unisexual.

Diplanate — flattened.

Diplazoid — compared to the paired, elongate sori of *Diplazium.*

Dissected — cut or divided into few or numerous segments; compound.

Distal — remote from the point of attachment.

Distant — an arrangement in which similar structures or parts (e.g., fronds, leaflets, etc.) are not closely aggregated; attached more or less remotely; not clustered.

Distichous — in two rows or vertical ranks.

dm. — decimeter or 10 centimeters (= 3.937 inches).

Dorsal — relating to the back or outer surface of an organ; the lower (abaxial) or sporangium-bearing side of most fern fronds.

Echinate — spiny.

Echinulate — minutely spiny.

Ellipsoid — a solid (3-dimensional) structure with an elliptic shape if cut along the long axis.

Elliptic — oblong with evenly rounded-tapered ends; widest at the middle.

Endemic — confined to a particular locality or region.

Entire —not toothed or lobed, especially with reference to leaf margins or the margins of other flat structures.

Epipetric — growing on rocks.

Epiphyte — a plant growing on or attached to another plant, but not parasitic.

Epispore — see perine or perispore.

Erose — with a ragged edge.

Excavate (adj.) — concave.

Excurrent — directed outward.

Exine; exospore — the integral wall of a spore, which may or may not be surrounded by a perine or perispore (q.v.).

Falcate — scythe-shaped; curved and tapering simultaneously (often asymmetric).

False veins — small or minute vascular strands in the tissue of the leaf, not connected to regular veins.

Farinose — coated with fine, meallike powder.

Fasciculate — tightly clustered.

Ferruginous — rust-colored.

Fibrillose — covered with fine fibrous scales.

Filamentous — threadlike; composed of threads.

Filiform — threadlike.

Fimbriate — fringed.

Flabellate — fan-shaped.

Flaccid — lax and weak; limp; flabby.

Flagellate — having an elongate, naked, whiplike apex.

Flexuous — sinuously zigzag.

Foliaceous — leaflike.

Forma; form; f. — a minor variant of a species.

Frond — the leaf of a fern, including the stipe and the blade (lamina).

Furcate — forked.

Furfuraceous — covered with minute flaky particles.

Gametophyte — the gamete-producing (sexual) generation of the pteridophyte life cycle; a prothallus.

Geminate — growing in equal pairs; forked from the base, with 2 equal branches.

Gemma (pl. **gemmae**) — a specialized vegetative bud or propagule.

Gene — a theoretical unit of heredity, now believed to consist of a large protein molecule capable of self-duplication.

Genus (pl. **genera**) — a group of related species (or in a "monotypic" genus, a single species without close relatives). The first name of a plant binomial is the generic name, showing its immediate relationship; the second is the specific or species name, designating the particular kind of plant.

Gibbous — bulging on one side; unequally inflated. Usually applied in a 2-dimensional sense, while bullate implies a similar shape in 3 dimensions.

Glabrescent — becoming glabrous or nearly so.

Glabrous — devoid of hairs.

Glandular — bearing glands; resembling a gland. (In plants the term "gland" is applied somewhat loosely to various waxy, resinous, or sticky secretions, as well as to the cells that secrete them. These may be immersed in epidermal tissue, or occur as minute outgrowths. "Glandular hairs" are usually distinguished by their enlarged, viscid tips.)

Glaucous — more or less whitened by a very thin waxy or powdery film.

Globose — spherical or nearly so.

Granulose — appearing covered with minute grains.

Hamate — hook-shaped at the tip.

Hastate — arrowhead-shaped, but with the basal lobes pointing outward nearly at right angles.

Herbaceous — Leaflike in color and texture; of relatively thin texture.

Herbarium — a collection of pressed, dried plants.

Heterosporous — with spores of two kinds.

Hirtellous — bearing minute rather stiff hairs.

Hirsute — hairy, usually with rather long, soft hairs.

Hispid — bearing stiff bristly hairs.

Hispidulous — minutely hispid.

Holotype — the particular specimen or illustration on which the name of a species or subdivision of a species is based. (See also isotype, lectotype, neotype, syntype, topotype, and type).

Homogeneous — of uniform composition or texture.

Homosporous — with spores all alike.

Hyaline — thin and translucent.

Hydathode — the enlarged tip of a vein; an epidermal structure supposedly for the secretion or exudation of water.

Hygroscopic — capable of reversably extending or contracting in response to the presence or absence of moisture.

Idioblasts — specialized epidermal cells containing oil, gum, or other substances not found in surrounding cells.

Imbricate — overlapping.

Immaculate — unspotted.

Incised — cut sharply and irregularly.

Indeterminate — pertaining to leaves, fronds, or shoots that appear to continue elongating indefinitely by apical growth.

Indument — Any covering, e.g., hairs or scales.

Indurated — becoming hardened.

Indusium (pl. **indusia**) — the scalelike or membranous flap of tissue covering (or sometimes subtending or enclosing) the sorus of many ferns.

Inferior — lower; underneath.

Infra- or **Intramarginal** — slightly set back from the margin.

Inframedial — pertaining to sori located nearer to the midvein than to the margin of the blade, pinna, or pinnule.

Intricate — finely interwoven.

Introgression — the introduction of a gene (hereditary factor) or more than one gene from one population to another by means of hybridization.

Involute — rolled inward.

Isotype — a duplicate of a holotype. Collectors often gather and distribute several more or less identical specimens (collected at the same time and place) to different museums under the same collection number. If one of these specimens becomes the type (holotype) of a new species (or variety, etc.), the others are called isotypes regardless of whether the author of the new species saw all the duplicates.

Keeled — bearing a sharp longitudinal ridge; carinate.

Lacerate (adj.) — irregularly cleft as if torn.

Laciniate — slashed; cut into narrow pointed segments.

Lamina — the expanded portion of a leaf or frond; blade.

Lanceolate — several times longer than wide, tapering at both ends but more gradually toward the apex, and widest below the middle.

Lance-ovate — having an outline intermediate between lanceolate and ovate.

Leaflet — a single division of a compound leaf; a pinna or pinnule.

Lectotype — a holotype selected by a later author from the elements on which a name with multiple types (syntypes) was based.

Ligulate — strap-shaped.

Linear — long and narrow with parallel margins, like a blade of grass.

Lithophyte — a plant growing on rocks, deriving nourishment from the atmosphere and accumulated humus. Many epiphytes can also grow as lithophytes.

Lobe — any segment of an organ, especially if rounded; in ferns a "lobed" frond division is one that is cut less than halfway to the rhachis, costa, or costule. If more deeply cut, the resulting divisions are called segments.

Lobed; lobate — divided into or bearing lobes; cut to the middle or less.

Lobulate — having small lobes.

Lobule — a small or minute lobe.

Locule — a compartment of a capsule or sporangium.

Lunate — crescent-shaped; half-moon-shaped.

Lustrous — shiny.

m. — meter (metre), measure of length equal to 39.37 inches.

Maculate — marked with spots.

Margin — edge (i.e. of a leaf or blade).

Marginal — attached to or on the edge.

Marginate — applied to a stipe or rhachis that is minutely keeled rather than winged laterally.

Megaspore — the larger of two kinds of spores in heterosporous pteridophytes, which after germination produces a female (archegoniate) gametophyte.

Membranous — thin and semitransparent.

Mesophytic — a habitat of medium moisture conditions, neither wet nor dry.

Micron — a measure of length equal to 1/1000 of a millimeter; usually written "μ."

Microspore — the smaller of two kinds of spores in heterosporous pteridophytes, which after germination produces a male (antheridial) gametophyte.

Midrib — the central or main vascular axis of a leaf or blade (equivalent to the term rhachis) or of any of its subdivisions (then equivalent to costa or costule).

mm. — millimeter, a measure of length equal to one-tenth of a centimeter, equivalent to 0.03937 of an inch or approximately 1/25 of an inch.

Monoecious — having both male and female reproductive structures on the same plant; bisexual.

Monolete — pertaining to a pteridophyte spore with one fissure in its exine.

Monotypic — having only one example or member (e.g., a genus with but one species).

Mucilage — a sticky, gelatinous substance of varying composition.

Mucro — a abrupt, spinelike tip.

Mucronate — tipped with a mucro.

Mucronulate — minutely mucronate.

Multicipital — many-branched.

Multiseriate — in two to many rows.

Muricate — beset with points.

Muriculate — minutely muricate.

Naturalized — of foreign origin, but established and reproducing itself as if indigenous.

Neotype — a new holotype not included in the original protolog of a species, designated by a later author when it appears that the original basis or bases of a name have been irretrievably lost or destroyed. The purpose of designating a neotype is to stabilize the application of a name.

Node — the place on a stem that normally bears one or more leaves, and from which a branch can originate. In some cases a node is marked by a line or swelling.

Nodose — knobby.

Oblique — slanting; unequal-sided.

Oblong — longer than broad and with more or less parallel sides.

Obovate — egg-shaped in outline, with the broader part above the middle.

Obtuse — blunt or rounded at the apex.

Orbicular — circular; round (2-dimensional).

Oval — broadly elliptic.

Ovate — egg-shaped in outline, with the broader part below the middle.

Paleaceous — clothed with scales; chaffy.

Palmate — pertaining to a leaf or frond whose lobes or divisions radiate from a single point; a compound blade with a rhachis.

Papillose — bearing minute nipple-shaped projections.

Paraphyses — sterile hairs of various shapes arising among sporangia.

Parietal — borne on or pertaining to a wall.

Partite — divided nearly to the base into unequal or nearly equal parts.

Pectinate — pinnatifid with the narrow segments set close like the teeth of a comb.

Pedate — palmately divided or parted with 3 major divisions, the lateral ones partite (2-cleft) above the base.

Pedicel — in ferns, the stalk of the sporangium.

Peduncle — in *Marsilea*, the stalk of a sporocarp.

Pellucid — translucent.

Peltate — pertaining to a leaf or some other flat organ attached to its support at a point on its lower surface (not at the margin).

Pendent; **pendulous** — hanging.

Pentagonal — five-angled.

Percurrent — extending throughout the length of a blade, or a subdivision of a blade, from base to apex.

Perennial — a plant without a fixed life span, growing indefinitely (though not necessarily continuously).

Perine; **perispore** — the husklike outer covering which surrounds the exine (q.v.) of many spores. Sometimes called epispore.

Persistent — evergreen; perpetuating or clinging indefinitely.

Petiole — the stalk of a leaf; in ferns usually called the stipe.

Phyllopodia — projections from a rhizome where fronds are or were attached; usually found in those species (or some of them) with articulate fronds (e.g., *Oleandra*).

Pilose — having long, soft hairs.

Pinna (pl. **pinnae**) — a primary division of the compound blade of a fern.

Pinnate — pertaining to a fern frond whose primary divisions extend fully to the rhachis, usually attached by the costa only; equivalent to "1-pinnate." The terms "2-pinnate," "3-pinnate," etc., refer to blades with further degrees of subdivision.

Pinnatifid — pinnately divided, the sinuses (q.v.) extending halfway or more to the rhachis, costa, or costule.

Pinnatisect — pinnately divided, the divisions attached by their full width to the rhachis, costa, or costule. This term intergrades with the preceding.

Pinnule — a secondary or tertiary (etc.) subdivision of a blade, attached at one point only (if attached by the whole basal edge, called a segment).

Planate — flat.

Plumose — featherlike.

Pluricellular — consisting of two to several or many cells.

Pluricostate — having more than one midrib or primary vein.

Polymorphic — having many forms or variants.

Procumbent — trailing or lying on the ground, but not rooting at the nodes.

Proliferous — producing offshoots or buds capable of forming new plants.

Prominulous — pertaining to leaf veins that are slightly raised above the surrounding surface, forming minute ridges.

Prothallus (pl. **prothalli**) — the gametophyte of a fern; a flat, broad, or ribbonlike, or else filamentous green structure resulting from the germination of a spore, and bearing organs of sexual reproduction (antheridia and archegonia, q.v.).

Pruinose — having a fine waxy-powdery secretion on the surface.

Pteridophyte — a fern or other spore-bearing vascular plant.

Puberulous — very minutely hairy; not glabrous.

Pubescent — clothed with hairs.

Punctate — dotted with minute translucent spots.

Pungent — ending in a sharp, rigid point.

Pustulate — blistered.

Pyriform — pear-shaped.

Quadrifoliolate — bearing four leaflets at the same point, as in *Marsilea.*

Radiate (adj.) — palmate.

Radicant — rooting, usually applied to fronds rooting at the tip.

Radiculose — having numerous minute hairlike rootlets.

Raphe — the ridge that connects the sporocarp with its peduncle in *Marsilea.*

Reflexed — abruptly bent backward and downward.

Reniform — kidney-shaped.

Repand — with slightly uneven margin.

Resinous — bearing or exuding a glistening substance resembling resin.

Reticulate — in the form of a network.

Retrorse — directed backward and downward.

Revolute — rolled backward, e.g., the margin of a leaf or frond.

Rhachis — the main axis of the blade (lamina) of a fern frond. Also spelled "rachis."

Rhizoid — a filamentous rootlike structure on the gametophytes of ferns; also similar structures elsewhere, as on the rhizomes of some filmy ferns.

Rhizome — the stem of a fern (often subterranean), from which the fronds are produced.

Rhizophore — a specialized structure emitting roots.

Rhombic — pertaining to an equilateral geometric figure having 2 acute angles.

Rosette — a cluster of fronds or other structures radiating in a circular pattern from a central point.

Rosulate — in the form of a rosette.

Rufous — brownish-red.

Rugose — wrinkled.

Rugulose — minutely wrinkled.

Sagittate — arrowhead-shaped, with the basal lobes directed downward.

Scabrous — rough (like sandpaper) to the touch.

Scale — a flat epidermal appendage related to a hair but 2- to many-celled in width.

Scandent — climbing, especially on tree trunks.

Scarious — thin, dry, and membranous, not green.

Sclerotic — hardened.

Scurfy — having a minute scaly-powdery covering; minutely scaly-roughened.

Secund — borne along one side of an axis.

Segment — a frond division (lobe) cut more than one-half to the axis but always attached to that axis by one edge, not at a single point.

Septate — divided by partitions.

Sericeous — silky; bearing adpressed, soft straight hairs.

Serrate — having sharp teeth pointing forward.

Serrulate — finely or minutely serrate.

Sessile — without a stalk.

Seta (pl. **setae**) — a bristle or stiff hair.

Setiferous — bristly.

Setose — bearing bristles.

Setulose — bearing minute bristles.

Simple — undivided; not compound.

Siphonostele — a type of stele in which the vascular tissues are arranged like a tube around a central pith or cavity.

Sinuate — having a wavy margin in one plane (flat).

Sinus — the cleft between two lobes or segments of a fern blade.

Solenostelic — having a tubular stele with both internal and external phloem (phloem tissues are the portion of a vascular bundle concerned with the conduction of nutrient materials).

Sorus (pl. **sori**) — a cluster of sporangia.

Spatulate; spathulate — gradually dilated upward to a rounded apex.

Species — an aggregate of individuals having the same distinctive characters; an interbreeding population not discontinuous in essential characteristics; a unit of classification designating a particular kind of organism.

Spermatozoid — a male ciliated gamete produced in an antheridium; also called an antherozoid.

Spike — a simple sporophyll bearing sessile sporangia on an elongate axis, as in *Ophioglossum*.

Spinulose — bearing small or minute spines.

Spongiose — of spongy texture.

Sporangiate — bearing sporangia.

Sporangiophore — a specialized structure bearing sporangia.

Sporangium (pl. **sporangia**) — a minute capsule containing spores.

Spore — a one-celled, asexual reproductive body, usually having a hard external wall of characteristic shape or appearance according to the particular species. Spores range in size from dustlike to the size of a grain of salt.

Sporiferous — spore-bearing.

Sporocarp — a hard, bony capsule containing sporangia, as in *Marsilea*.

Sporophyte — a spore-bearing plant; the spore-producing generation of a fern life cycle.

Stele — collective term for those parts of stems and roots that contain vascular tissues; the single or several vascular bundles of a stem viewed collectively.

Stellate — starlike or star-shaped; branched from one point, with 3 or more branches, as the stellate hairs of certain ferns.

Sterile — not bearing any spores or gametes; lacking reproductive structures.

Stipe — the stalk of a fern frond, corresponding in function to the petiole of an angiosperm leaf.

Stipitate — having a stipe.

Stolon — an elongate basal branch, usually not leafy, often rooting at nodes.

Stoloniferous — producing or bearing stolons.

Stoma (pl. **stomata**) — a minute pore in the epidermis of a leaf or frond.

Stramineous — straw-colored.

Strict — very straight and upright.

Strigose — with adpressed or ascending, stiff, straight hairs.

Strigulose — minutely strigose.

Strobile; strobilus — a compact cluster of sporophylls; a cone.

Subulate — awl-shaped.

Succulent — rather thick and juicy.

Sulcate — grooved.

Supramedial — pertaining to sori located nearer to the margins than to the midvein, but not touching the margin.

Surcurrent — with winged expansions from the base of a pinna or segment prolonged up the rhachis; the opposite of decurrent (q.v.).

Synangium (pl. **synangia**) — an oblong mass or aggregation of cohering sporangia.

Syntype — one of two or more specimens cited in the original description of a species, variety, or form, when none is especially designated the holotype. If one of these is later selected as the holotype, it is called the lectotype (q.v.).

Taxonomy — the science of classification.

Terete — circular in cross-section.

Ternate — having three subequal divisions; arranged in threes.

Terrestrial — growing on the ground.

Tomentose — densely clothed with matted soft hairs.

Tomentum — densely matted woolly hairs.

Topotype — A specimen collected at the same locality as a type, at a later date.

Translucent — capable of transmitting light.

Trichome — any hairlike outgrowth.

Trifoliate — pertaining to a frond divided into three subequal parts.

Trilete — pertaining to a fern spore with three fissures in its exine.

Truncate — terminating abruptly, as if cut off.

Tuberculate — bearing knobby projections.

Turbinate — top-shaped.

Type — the original specimen, material, or illustration(s) from which the description of a newly discovered plant was drawn up (rarely, the type is the description alone, in the absence of a specimen or illustration); a holotype. A "type species" is the type of a genus, a "type genus" the type of a family, and so on. The "type concept" is chiefly useful in fixing the application of names. See also holotype, isotype, lectotype, neotype, syntype, and topotype.

Uncinate — hooked; hook-shaped. See also hamate.

Undulate — with a wavy margin (not flat).

Urceolate — urn-shaped.

Variety — a subdivision of a species; a biological race.

Vascular — pertaining to special tissues that conduct fluids.

Vein — a strand of vascular tissue in a leaf or frond.

Veinlet — a minute vein; a venule.

Venation — pertaining to the arrangement of veins.

Ventral — the adaxial (usually upper) surface of a leaf or frond; the opposite of dorsal.

Venule — a minute vein.

Verrucose — covered with small wart-like projections.

Verticillate — arranged in whorls.

Villous — bearing long, soft, straight hairs.

Xerophyte — a plant of dry habitats.

Xylem — the woody elements of a vascular bundle, concerned with the conduction of water.

Zygote — a fertilized egg-cell.

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AUTHOR
Proctor, George R

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